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84- 2924 /

# TARGETING HIGH-GROWTH INDUSTRY

# TARGETING HIGH-GROWTH INDUSTRY

A Consideration of the
Advantages and Disadvantages
of Adopting Such an Industrial
Strategy in Canada

by

Roy E. George

The Institute for Research on Public Policy
L'Institut de recherches politiques
Montreal

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Printed in Canada

Legal Deposit Fourth Quarter
Bibliothèque nationale du Québec

**Canadian Cataloguing in Publication Data**

George, Roy E., 1923-
Targeting high-growth industry

Bibliography: p.
ISBN 0-88645-003-9

1. Industry and state. 2. Industry and state—Canada. 3. Canada—Economic policy. I. Institute for Research on Public Policy. II. Title.

HD3611.G46 1983 338.971 C84-090016-3

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**L'Institut de recherches politiques**
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## FOREWORD

The question of an industrial strategy for Canada has had a prominent place in Canadian debate for many years.

Most recently, there have been several advocates for adoption in Canada of a strategy of "picking winners." This means identifying and providing government support to industries with a high growth potential. As a corollary, it means not providing support to industries deemed to be "non-winners."

Such a strategy has much to commend it, in principle. It would pose major problems, however, for many existing industries, for many workers, for certain communities and for some regions. Its success, if implemented, would depend crucially on the ability of governments in Canada, federal or provincial, to correctly identify the winning industries and to provide the appropriate type and amount of support. There are many who question the capacity of governments to be so wise and who therefore doubt the wisdom of the strategy for Canada.

Professor George has approached the question by undertaking an examination of Canadian experience to date along with an examination of the experience several other countries have had with a strategy of targeting high-growth industries. He brings to light information Canadian policy makers should take into account if they contemplate adopting such a strategy for Canada.

The publication of this study is sponsored by the Institute's Regional Employment Opportunities Program. While the study is not specific to a particular region, any industrial strategy adopted in

Canada will have implications for regional development policy. As individual provinces formulate their own industrial development plans, the lessons to be learned from Professor George's study will be extremely relevant.

Gordon Robertson
President
October 1983

## AVANT-PROPOS

Depuis nombre d'années, la question d'une stratégie industrielle pour le Canada alimente les débats au pays.

Récemment, plusieurs personnes se sont prononcées en faveur d'une stratégie de désignation des " gagnants " qui consiste à identifier les industries les plus prometteuses et à leur accorder l'aide de l'État. Cela signifie aussi qu'on refuse de l'aide aux industries jugées " perdantes ".

En principe, une telle stratégie est fort louable. Elle occasionnerait cependant d'importants problèmes à de nombreuses industries établies, à de nombreux travailleurs ainsi qu'à certaines collectivités et à certaines régions. Si l'on devait la mettre en oeuvre, son succès reposerait avant tout sur l'aptitude des gouvernements canadiens, fédéral et provinciaux, à identifier les industries gagnantes et à leur accorder les appuis indiqués en quantité suffisante. D'aucuns doutent que les gouvernements puissent être si avisés, et par conséquent de la sagesse d'une telle stratégie pour le Canada.

Le professeur George a abordé la question par le biais d'un examen de l'expérience du Canada à ce jour et de l'expérience d'autres pays qui ont mis en oeuvre une stratégie de désignation des industries à fort potentiel de croissance. Il dévoile des renseignements dont les décideurs canadiens se devraient de tenir compte dans la mesure où ils songent à adopter une telle stratégie pour le Canada.

Le programme sur l'emploi au niveau régional de l'Institut s'est chargé de la publication de cette étude. Bien que l'étude ne vise aucune

région en particulier, toute stratégie industrielle que le Canada pourrait adopter aura des répercussions sur la politique d'expansion régionale. L'enseignement procuré par l'étude du professeur George s'avérera fort pertinent à mesure que chacune des provinces élaborera ses propres plans de développement industriel.

Gordon Robertson
Président
Octobre 1983

## EXECUTIVE SUMMARY

Concern is nowadays frequently expressed that Canada's industrial structure is dominated by mature industries that are threatened by developing countries and hold out poor prospects for future growth. The government of Canada is urged to reshape this structure by adopting a strategy aimed at expanding winning industries (assumed to be "high technology" industries, though this term has no generally accepted definition), thereby reducing the relative importance of traditional industries and improving the country's economic prospects.

A survey of the industrial strategies of ten countries (Canada, Ireland, the United Kingdom, Norway, Sweden, West Germany, the Netherlands, France, Italy and Japan) was undertaken in the first half of 1982 to determine the extent to which targeting winning industries had been attempted, the methods used, and the success achieved. ("Targeting" was taken to mean selecting industries with especially good prospects of growth and introducing measures to encourage that growth, and the term "industries" was used in the sense of groups of manufacturing firms making similar products.)

The picture that emerges is mixed. No Canadian provincial government has followed a consistent strategy of concentrating its economic development efforts on industries thought to have particularly good prospects of growth; and, while federal governments have from time to time striven to build up certain industries, at least in part because the prospects of those industries appeared particularly good (the nuclear and aircraft industries are two examples), their

efforts have been haphazard and they have devoted much more resources to rescuing mature industries in distress.

The other countries surveyed fall roughly into two groups. The first contains those that are devoted to strategies of targeting winners, and includes Japan and France as firm members, while Ireland is a sort of associate member operating in a pragmatic fashion. Their governments profess to believe that private enterprise cannot be relied upon to develop promising industries because of their high risk, their long pay-off period and the large scale required for viability, because they provide less benefits to the firms involved than to society as a whole, and because firms' lack of knowledge of opportunities retards progress.

The remaining countries belong with varying degrees of loyalty to the second group. Though they have had lapses, their governments generally profess to believe that bureaucrats cannot be expected to be better at picking winners than are business people with intimate knowledge of their own industries, that success in today's highly volatile situation requires quick decisions and rapid adjustments, for which bureaucratic machines are poorly suited, and that mistakes on the grand scale on which governments operate do more harm to society than do mistakes in the smaller scale and more diversified projects of private enterprise. West Germany is the most faithful member of this group, but Sweden, Norway, the Netherlands and Italy also owe it fairly strong allegiance. The final member, the United Kingdom, has vacillated, but its present government vehemently claims full membership, though it does not consistently conform to the rules.

The methods employed to identify industries likely to become winners have included the use of ostensibly highly scientific analytical procedures, but none is capable of producing useful results except on the basis of subjective judgements made by public servants or other people; and, since such judgements must be made with imperfect insight into the future, picking winners is a chancy business with high risk of error. Also, results produced by analysis are invariably modified by political processes before they become part of governments' strategies.

Having selected potential winners as best they can, governments must then devise ways of stimulating their growth. Governments of all

countries surveyed have a bewildering array of incentives for manufacturing industry (grants, loans, guarantees, industrial parks, tax concessions and the like), which may be available to firms whichever manufacturing industry they belong to, but, since administrative preference may be given to industries considered particularly desirable and no incentive is neutral among industries (for instance, grants for research and development favour industries of the type that need to do a lot of research and development), promising industries do sometimes receive special treatment. Also, most countries have assistance available exclusively to industries identified as winning industries –favoured treatment in government purchasing, joint ventures with governments, and subsidization of customers, as well as the establishment of government-funded research facilities and protection from foreign competition by tariffs and other barriers to imports. How effective such measures have been appears to depend to a great extent upon relationships between business and government; if, as in Japan and France, such relationships are close, governments will have their way more often than elsewhere, where business regards government with some suspicion and co-operates only when incentives are irresistible.

Assessment of the success of strategies of picking winning industries in the countries surveyed must be tentative. Many programs are new and have not had time to take effect, and so many forces are at work in countries' complicated economic environments that one cannot with certainty determine causal relationships. However, it should not be necessary to prove that a strategy will be ineffective; rather, the onus should be laid upon those advocating the adoption of government strategies, which require large amounts of public money, to prove that such strategies are likely to be successful.

The record of the countries surveyed suggests that the onus of proving that a strategy of targeting winning industries is likely to be effective in Canada would be difficult to discharge. The record of Canada itself contains a number of horror stories of governments supporting firms, at least in part because a good future was forecast for them. For instance, the enormously expensive sorties into nuclear energy and aircraft have left industries set up to produce things that technically may be admirable but that are commercial flops. France

has been more successful in nuclear energy, aircraft, and in a few other industries, but has suffered miserable failure in electronics, data processing and some other industries. Japan, which is usually cited in vindication of strategies of targeting winning industries, has similarly had very mixed results. Japanese governments undoubtedly did much to speed the expansion of basic industries in the 1950s and 1960s (which, incidentally, had to be reversed in the 1970s when these industries turned out to be losers rather than winners), but their attempts to create viable activities in the petrochemical, aircraft, nuclear and mainframe computer industries have achieved little success; and there is a strong sentiment in Japan that the successes in micro-electronics and certain other industries, which so impressed observers in the 1970s, have been due more to energetic entrepreneurship, superior management, diligent workers and plain good luck, than to government strategies.

Nor does there seem to have been significant correlation between strategies of targeting winning industries and general industrial development in the countries surveyed. Japan, one of the strongest supporters of the strategy, has achieved outstanding industrial growth; but then so has West Germany, the strategy's greatest opponent. France, the other main devotee to the strategy, has a very respectable record of industrial growth; but Sweden, a strong antagonist, has continued to hold its own as an international exporter of sophisticated equipment, inspite of being a country with a tiny population of eight millions. Of the remaining countries, those that have done some targeting have sometimes fared better, and sometimes worse, than those that have done very little.

The experience of the countries surveyed therefore emphasizes the difficulty of picking winners and the limited success governments in the political environment of Canada may expect if they set out to stimulate viable growth in the industries chosen. There is a distinct danger that such a strategy in Canada would merely saddle the country with "infant industries" that would grow into permanent invalids, especially as the industries likely to be favoured are the so-called "high technology" industries, which may well quickly find themselves in a world market glutted with the output of competing industries whose

growth is being forced in many other countries. The costs of such an unsuccessful strategy may be hidden by protection and preference in government purchasing, but they must still be borne in the end by the Canadian society. There is also the danger that concentration on winning industries would result in the neglect of promising firms just because they happened to belong to losing industries.

Since governments cannot support all industries, reverence of new glamorous industries may steer emphasis away from those industries, in manufacturing and other sectors, that have given Canadians one of the highest standards of living in the world. Yet the continued success of many of these traditional industries is confirmation that they are well suited to the Canadian environment. There is little evidence that the new industries often assumed to have prospects of exceptional growth would find that environment so congenial.

Lack of proof that a strategy of targeting winning industries would be beneficial to Canada suggests that the pressure on governments to adopt it may perhaps have arisen for reasons other than a desire to accelerate economic growth: for reasons of vested interest, economic nationalism, snobbishness (the label "hewers of wood and drawers of water" rankles with some Canadians), and the pressures imposed upon public servants periodically to come up with novel prescriptions for economic development policies. Also, the strategy probably is attractive to many people because it appears to offer an easy way out of Canada's economic problems (prosperity without tears!).

Rejecting a strategy of targeting winning industries leaves strategy makers with only the well-known, unexciting options–improving Canada's resources by better training of workers, technicians and managers, stimulating the entrepreneurial spirit, improving the availability of capital funds, building bridges between the resources of universities and the needs of industry, increasing the flow of knowledge of business opportunities and techniques, delivering development programs more effectively and, above all, trying to instill in Canadians the will to strive harder. But there is no easy path to economic salvation.

## ABRÉGÉ

D'aucuns s'inquiètent souvent de nos jours que la structure industrielle du Canada soit dominée par des industries d'âge mûr qui sont menacées par les pays en voie de développement et qui offrent de faibles perspectives de croissance. On somme le gouvernement canadien de réorganiser cette structure en adoptant une stratégie en vue de l'expansion des industries " gagnantes " (que l'on suppose être des industries " de pointe " bien qu'il n'existe aucune définition figée de cette expression), ce qui minimiserait l'importance relative des industries traditionnelles et améliorerait les perspectives économiques du pays.

Au cours du premier semestre de 1982, on a effectué une enquête sur les stratégies industrielles de dix pays (le Canada, l'Irlande, le Royaume-Uni, la Norvège, la Suède, l'Allemagne de l'Ouest, les Pays-Bas, la France, l'Italie et le Japon) afin d'établir dans quelle mesure on avait tenté de désigner les industries gagnantes, par quels moyens et avec quel succès. (Dans ce cas-ci, la " désignation " voulait dire le choix d'industries offrant des perspectives de croissance particulièrement prometteuses et l'introduction de mesures pour favoriser la croissance, et le terme " industries " avait gardé son acceptation de groupes d'entreprises fabriquant des produits semblables.)

Le portrait qui en ressort est mixte. Aucun gouvernement provincial au Canada n'a suivi une stratégie constante voulant qu'il concentre ses efforts d'expansion économique sur des industries offrant

apparemment des perspectives particulièrement prometteuses de croissance; et, tandis que les gouvernements fédéraux ont de temps à autre cherché à échafauder de nouvelles industries, du moins en partie parce que les perspectives de ces industries apparaissaient particulièrement prometteuses (l'industrie nucléaire et l'industrie de l'aviation en sont deux exemples), cela a été fait à l'aveuglette et l'on a consacré beaucoup plus de ressources à réchapper des industries mûres en perte de vitesse.

Les autres pays se rangent grosso modo en deux groupes. Le premier renferme ceux dont la stratégie consiste à désigner des gagnants et comprend le Japon et la France comme membres de plein titre, tandis que l'Irlande peut être qualifiée de membre associé fonctionnant de manière pragmatique. Leurs gouvernements affirment croire que l'on ne peut se fier à l'entreprise privée pour développer des industries prometteuses en raison du grand risque, de la longue période de recouvrement et de l'envergure exigée pour la viabilité, et aussi parce qu'elle procure moins d'avantages aux entreprises en cause qu'à la société dans son ensemble, et que le manque de connaissance des possibilités chez les entreprises retarde le progrès.

Les autres pays appartiennent, avec une loyauté plus ou moins grande, au second groupe. Bien qu'ils aient dérogé à l'occasion, leurs gouvernements affirment en règle générale que l'on ne peut s'attendre que les bureaucrates choisissent les gagnants avec plus de succès que les gens d'affaires qui connaissent intimement leurs propres industries, que le succès sur les actuels marchés fort volatiles exige des décisions rapides et des adaptations ponctuelles auxquelles sont mal préparées les machines bureaucratiques, et que les erreurs commises à l'échelle des gouvernements nuisent davantage à la société que celles commises à la plus petite échelle de l'entreprise privée aux activités plus diversifiées. L'Allemagne de l'Ouest est le membre le plus fidèle de ce groupe, bien que la Suède, la Norvège, les Pays-Bas et l'Italie lui soient aussi assez loyaux. Le dernier membre, le Royaume-Uni, a vacillé, mais son gouvernement actuel clame bien haut sa pleine participation bien qu'il ne se conforme pas toujours aux règlements.

Parmi les méthodes utilisées pour identifier les industries susceptibles de devenir gagnantes, on compte le recours à des procédés

analytiques de toute évidence fort scientifiques dont aucun n'est cependant capable de produire des résultats utiles si ce n'est sur la base de jugements subjectifs opérés par des fonctionnaires ou d'autres personnes; et, puisque de tels jugements s'appuient sur une connaissance imparfaite de l'avenir, le choix des gagnants est une affaire de chance comportant de grands risques d'erreurs. De plus, le processus politique modifie inévitablement les résultats produits par l'analyse avant qu'ils ne deviennent partie intégrante des stratégies des gouvernements.

Une fois que les gouvernements ont choisi de leur mieux les gagnants éventuels, ils doivent ensuite trouver des façons de stimuler leur croissance. Les gouvernements de tous les pays étudiés utilisent une gamme déroutante de stimulants de l'industrie manufacturière (subventions, prêts, garanties, parcs industriels, dégrèvements fiscaux et ainsi de suite) qui peuvent être offerts à des entreprises appartenant à n'importe quelle industrie manufacturière. Toutefois, puisqu'on peut accorder la préférence administrative à des industries jugées particulièrement désirables et qu'aucune incitation ne s'applique de la même façon à toutes les industries (par exemple, les subventions de recherche et de développement favorisent les industries qui privilégient ce secteur), les industries prometteuses reçoivent parfois effectivement un traitement de faveur. De plus, la plupart des pays offrent de l'aide exclusivement aux industries jugées gagnantes – traitement de faveur dans les achats par l'État, entreprises en coparticipation avec l'État, subventions aux consommateurs, création d'installations de recherche financées par l'État et protection de la concurrence étrangère grâce à des tarifs et d'autres barrières à l'importation. L'efficacité de telles mesures semble dépendre pour une bonne part des rapports entre l'État et l'entreprise; si, comme au Japon et en France, ces rapports sont étroits, les gouvernements auront gain de cause plus souvent qu'ailleurs où l'entreprise se méfie quelque peu de l'État et ne coopère que lorsque les stimulants sont irrésistibles.

Toute évaluation du succès des stratégies visant à choisir des industries gagnantes dans les pays enquêtés ne peut être que préliminaire. De nombreux programmes sont récents et n'ont pas eu le temps de faire leurs preuves d'autant plus que tellement de facteurs entrent en jeu dans les complexes milieux économiques des pays étudiés

qu'on ne peut établir avec certitude des liens de cause à effet. Il ne devrait cependant pas être nécessaire de démontrer qu'une stratégie sera inefficace; il devrait plutôt revenir à ceux qui prônent l'adoption de stratégies de l'État, stratégies qui exigent d'importantes sommes d'argent public, de démontrer que de telles stratégies atteindront leurs buts.

Le dossier des pays étudiés laisse entendre qu'il serait difficile au Canada d'imputer la responsabilité de démontrer qu'une stratégie de désignation des industries gagnantes serait probablement efficace. Le dossier du Canada lui-même renferme un nombre d'histoires d'horreur de gouvernements appuyant, du moins en partie, des entreprises en raison de leurs perspectives prometteuses. Par exemple, les engagements fort coûteux envers l'énergie nucléaire et l'aviation ont donné des industries capables de fabriquer des produits certes techniquement admirables mais sans valeur commerciale. La France a eu plus de succès avec l'énergie nucléaire, l'aviation et quelques autres industries, mais a connu des échecs misérables dans l'électronique, le traitement des données et d'autres industries. Le Japon, que l'on cite habituellement comme exemple de réussite des stratégies de désignation d'industries gagnantes, affiche lui aussi des résultats on ne peut plus mixtes. Les gouvernements japonais ont sans doute grandement aidé l'expansion des industries de base au cours des années 1950 et 1960 (politique que l'on a, soit dit en passant, abandonnée au cours des années 1970 lorsque ces industries se sont avérées perdantes plutôt que gagnantes), mais leurs tentatives de rentabiliser les activités des industries de la pétrochimie, de l'aviation, du nucléaire et des grands ordinateurs ont connu peu de succès; et d'aucuns pensent au Japon que le succès de la microélectronique et d'autres industries, qui a tellement impressionné les observateurs au cours des années 1970, dépend davantage de la force de l'esprit d'entreprise, d'une gestion plus avisée, de travailleurs plus consciencieux et de simple bonne chance que des stratégies de l'État.

Il ne semble pas non plus y avoir de corrélation significative entre les stratégies de désignation d'industries gagnantes et le développement industriel général dans les pays étudiés. Le Japon, un des adeptes les plus fervents de ces stratégies, a connu une croissance industrielle

remarquable; mais cela est aussi le cas le l'Allemagne de l'Ouest, le plus grand opposant d'une telle stratégie. La France, l'autre grand partisan de cette stratégie, a un dossier fort respectable de croissance industrielle; par contre la Suède, un farouche opposant, a maintenu sa position en tant qu'exportateur international d'équipement perfectionné malgré sa petite population de huit millions d'habitants. Parmi les autres pays, ceux qui ont effectué une certaine désignation ont réussi parfois mieux et parfois moins bien que les pays qui se sont peu adonnés à cette pratique.

L'expérience des pays étudiés met donc en relief la difficulté de choisir des gagnants et le succès limité auquel peuvent s'attendre des gouvernements dans le milieu politique du Canada s'ils ont espoir de stimuler une croissance viable dans les industries choisies. Il existe un réel danger qu'une telle stratégie au Canada ne fasse qu'imposer au pays une couvée " d'industries naissantes " qui deviendraient des invalides permanents, surtout dans la mesure où les industries qui risquent d'être désignées sont les industries que l'on appelle " de pointe ", qui pourraient bien se retrouver au sein d'un marché mondial encombré du produit d'industries concurrentes dont la croissance est forcée dans plusieurs autres pays. Bien que la protection et la préférence dans les achats de l'État puissent masquer les frais de l'échec d'une telle stratégie, il reste que la société canadienne doit néanmoins les assumer. On risque aussi, en se concentrant sur les industries gagnantes, de négliger des entreprises prometteuses tout simplement parce qu'elles appartiennent à des industries perdantes.

Puisque les gouvernements ne peuvent pas appuyer toutes les industries, l'adulation des nouvelles industries à la mode peut nous faire négliger des industries, manufacturières et autres, qui ont permis aux Canadiens d'atteindre un des plus hauts niveaux de vie au monde. Pourtant, le succès permanent de plusieurs de ces industries traditionnelles ne fait que confirmer le fait qu'elles sont bien adaptées au milieu canadien. Rien n'indique que les nouvelles industries, auxquelles on attribue souvent des perspectives de croissance exceptionnelle, trouveraient ce milieu aussi favorable.

Le manque de preuves voulant qu'une stratégie de désignation d'industries gagnantes puisse profiter au Canada laisse entendre que les

pressions exercées sur le gouvernement en faveur de son adoption sont peut-être soumises à des facteurs autres que le désir d'accélérer la croissance économique : pour des raisons de droits acquis, de nationalisme économique, de snobisme (l'expression porteurs d'eau agace certains Canadiens) et des pressions imposées de temps à autre aux fonctionnaires afin qu'ils signent de nouvelles ordonnances pour stimuler le développement économique. De plus, la stratégie attire probablement de nombreuses personnes parce qu'elle semble offrir un moyen facile de se sortir des problèmes économiques du Canada (la prospérité sans douleur!).

Le rejet d'une stratégie de désignation des industries gagnantes ne laisse aux stratèges que les choix bien connus et peu excitants – améliorer les ressources du Canada en donnant une meilleure formation aux travailleurs, aux techniciens et aux gestionnaires, en stimulant l'esprit d'entreprise, en augmentant l'offre de capitaux, en assortissant les ressources des universités et les besoins de l'industrie, en diffusant les renseignements sur les possibilités et les techniques d'affaires, en améliorant la mise en oeuvre des programmes de développement et, surtout, en essayant de donner aux Canadiens la volonté d'essayer encore plus fort. Toutefois, le chemin qui mène vers le salut économique n'est pas de tout repos.

## ACKNOWLEDGEMENTS

The research upon which this monograph is based was only possible because members of the Department of Industry, Trade and Commerce at the Canadian posts in some nine countries were good enough to arrange interviews, because F.A.D. Blair of that department in Halifax co-ordinated the interview arrangements, and because many politicians, public servants and academics took the time and trouble to discuss public policy and provide information to me and my associates.

Part of the field work was undertaken by K.A.J. Hay of Carleton University and by C.R. Dipchand and R.G. Storey of Dalhousie University, and their knowledge and interview skills were major contributions.

During the planning and drafting stages, I received valuable comments from J.D. McNiven, R.K. Fletcher and T. Merklinger of the Nova Scotia Department of Development, A.G. DeWolf of the Ministry of State for Economic and Regional Development, D.A. Vardy of the Newfoundland Executive Council, R.G. Robertson of The Institute for Research on Public Policy, B.D. Lesser of Dalhousie University, T. Wilson of the University of Glasgow, K.J. Allen of the University of Strathclyde, and an anonymous reviewer.

Virginia LeBlanc of The Institute for Research on Public Policy provided very expert word-processing services in producing drafts and the final version of the text.

To all these, and to many others who helped in various ways, I offer my grateful thanks.

This monograph has been based upon a report produced in 1982 by BGI Management Consultants Limited. That report was commissioned by the Nova Scotia Department of Development and the Department of Regional Economic Expansion, and I acknowledge their permission to use data from it.

Conclusions and opinions contained in this monograph are, of course, entirely mine and do not necessarily coincide with those of the Government of Nova Scotia, the Government of Canada, BGI Management Consultants Limited, or others who contributed to the study.

R.E.G.

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## Chapter One
## INTRODUCTION

### The Debate

Public debate about the industrial future of Canada tends these days to revolve around the question of whether or not governments should "target winning industries" (or "back winners"). What precisely this term means–for instance, whether it is limited to manufacturing or extends to mining and other sectors, whether it refers to general industries like electrical products manufacturers or individual firms or groups of firms that make (or just use?) specialized products like computers, and whether or not it means the same as "high technology"–is never defined. But that does not seem to slow down the debate. It is apparently enough that it is the antithesis of "backing losers"–propping up ailing industries–a government preoccupation all over the world.

Those who advance the argument that Canada should adopt an "industrial strategy" of targeting winning industries stress that the present industrial structure of Canada must give cause for great concern. As Table 1 shows, the principal manufacturing industries upon which the country relies–petroleum refining, pulp and paper mills, motor vehicle manufacturers, and so on–are in the main old, mature, slow-growth industries. It is alleged that they are being caught in a pincer movement: their products are of the type that become relatively unattractive as the population's standard of living rises, so that they can expect to receive a smaller and smaller proportion of each dollar spent; at the same time as the demand for their products is

Table 1

**LEADING MANUFACTURING INDUSTRIES RANKED BY VALUE OF SHIPMENTS OF OWN MANUFACTURE, CANADA, 1980**

| Rank | Industry | Value of Shipments of Own Manufacture ($ Millions) |
|---|---|---|
| 1 | Petroleum Refineries | 14 414 |
| 2 | Pulp and Paper Mills | 10 908 |
| 3 | Motor Vehicle Manufacturers | 10 071 |
| 4 | Meat and Poultry Products Industries | 7 933 |
| 5 | Iron and Steel Mills | 6 431 |
| 6 | Sawmills, Planing and Shingle Mills | 5 430 |
| 7 | Misc. Food Industries | 5 160 |
| 8 | Misc. Machinery and Equipment Manufacturers | 5 028 |
| 9 | Manufacturers of Industrial Chemicals | 4 719 |
| 10 | Dairy Products Industry | 4 309 |
| 11 | Metal Stamping, Pressing and Coating | 3 777 |
| 12 | Motor Vehicle Parts and Accessories | 3 610 |

**Source:** Statistics Canada, Manufacturing Industries of Canada: National and Provincial Areas, 1980 (Cat. 31-203).

declining relative to the demand for the output of other industries, there is also a serious threat on the supply side. The industries upon which Canada now relies are the very ones that newly industrializing nations like South Korea, Taiwan and Singapore are developing and proving that they can operate at lower cost than seems to be possible in Canada. The prospect consequently seems to be that, if nothing is done about the situation, the industries upon which we rely, at least in part, for our standard of living and which we have hitherto looked upon as "engines of growth," will have difficulty even in surviving (indeed some are already at this stage); and they will be incapable of maintaining the standard of life we expect.

Supporters of the strategy of targeting winning industries believe that Canada's only hope lies in a restructuring of its industry. They urge that new industries which seem to have capability to grow quickly should be identified and helped to grow; and that while the existing mature, slow-growth industries should not be abandoned, they should be allowed to shrink in importance as the "winners" expand. They predict that, if this strategy is followed, the structure of Canadian industry can be changed from one with a dubious future to one that is progressive and able to secure prosperity and independence for Canadians. Since private industry apparently cannot effect this transformation, they conclude that government intervention will be required. Appropriate industries will have to be identified, protected from foreign competition (preferably by the "non-tariff" type of protection, like preference in government purchasing), and supported by tax concessions and subsidies.

The public debate on this matter is really not much of a debate at all. The leading advocate of the strategy is the Science Council of Canada, which has for years been putting out a stream of publications consistently pressing this point of view. Perhaps because of the Council's prestige, and perhaps for other reasons to be discussed in Chapter Four, the desirability of such a strategy seems to have been accepted uncritically by the press, and by some bureaucrats and politicians, as if it is self-evidently correct and unchallengeable.

Some opponents of the proposed strategy have expressed their misgivings. Professor Palda,[1] of Queens University, for instance, has

published a devastating attack on the proposed policy, questioning the competence and objectivity of the authors of the Council's publications and criticizing their arguments for the sloppy unscientific research and reasoning on which they were based, for the lack of proof that the "high technology" products they recommend have any prospects of being produced competitively in Canada, and for the absence of any attempt to assess the cost to Canada of implementing the proposed strategy. And a few other commentators[2] have criticized it. But the winner-pickers hold the stage: their opponents seem to be questioning virtue and motherhood.

This monograph is intended as a contribution to the debate. It recognizes that Canada is not an island in this matter, the debate having raged in other countries for some time and governments having taken positions, with various results. There seemed the possibility that Canada might learn something by studying the experience of a sample of other similar countries. It is based upon a survey carried out in the first half of 1982.

## The Sample

The sample selected comprised eight Western European countries–the United Kingdom, West Germany, France, Italy, the Netherlands, Sweden, Norway and Ireland–and Japan. None is, of course, similar to Canada in all respects. As Table 2 shows, all are geographically smaller than Canada (since Canada is the second largest country in the world, that is hardly surprising); indeed some (Ireland and the Netherlands are the extreme examples) are tiny by comparison.

None can match Canada's natural resources. It is true that coal reserves are fairly general and that the United Kingdom, Norway and, to a lesser extent, the Netherlands have plenty of oil or natural gas, or both; Norway, West Germany and France have water power; Sweden has its forests; Sweden and West Germany have other minerals. But these are meagre compared with Canada's vast storehouse of natural wealth. At the other end of the scale, Ireland and Japan have very little in the way of natural resources, while France and Italy are not much better off.

No country is so economically bound up with any other country as

**Table 2**

**SELECTED CHARACTERISTICS OF COUNTRIES SURVEYED**

| Country | Population[a] (millions) | Area (thousands of sq. kms) | Manufacturing Output as Per Cent of Gross Domestic Product[b] | Exports as Per Cent of Gross Domestic Product[c] |
|---|---|---|---|---|
| Canada | 25 | 9 976 | 20 | 29 |
| Ireland | 3 | 70 | 20 | 54 |
| United Kingdom | 56 | 244 | 21 | 28 |
| Norway | 4 | 324 | 15 | 48 |
| Sweden | 8 | 450 | 21 | 30 |
| West Germany | 62 | 249 | 36 | 27 |
| Netherlands | 14 | 41 | 24 | 53 |
| France | 54 | 544 | 26 | 22 |
| Italy | 56 | 301 | 30[d] | 25 |
| Japan | 118 | 378 | 30 | 14 |

**Sources:** Encyclopaedia Britannica, Book of the Year 1983; OECD, National Accounts, Vol. 11, 1963-1980.

**Notes:**
a. 1982 except Ireland and United Kingdom, which are 1981
b. 1980 except Ireland (1977) and Netherlands (1978)
c. 1980
d. Includes mining and quarrying

Canada is with the United States. The nearest is Ireland, which used to be an economic satellite of the United Kingdom, but since it joined the European Economic Community this dependence has been greatly reduced. The economies of all the European countries are interdependent, and the United States is Japan's largest export market, but in no case does the trading pattern of any country in the sample resemble that of Canada's 70 per cent dependence on the United States.

However, the similarities are considerable. All are in the Northern Hemisphere and their inhabitants live in what might generally be termed temperate climates. The populations of the sample countries vary from Japan's 118 millions to Ireland's 3 millions, but Canada is roughly in the middle of the array with its 25 millions. With the exception of Ireland, all are fairly mature industrialized countries. The industry of the United Kingdom led the way with the so-called first industrial revolution of the late eighteenth and early nineteenth century, but was followed during the nineteenth century by almost all the other sample countries, though the fastest movement towards industrialization in Norway and Japan occurred after the Second World War. Only Ireland lags behind in this respect and even it has made significant strides since it opened up its economy and embarked upon a policy of industrialization in the middle 1950s.

All countries surveyed are heavily involved in international trade relative to the value of their production (measured in Table 2 by gross domestic product). Ireland, the Netherlands and Norway comfortably lead the table in this respect, Canada is in the middle with Sweden, Italy, West Germany, the United Kingdom and France, while Japan trails some way behind.

All are by world standards wealthy countries–including even Ireland, though it is next only to Greece as the poorest member of the European Economic Community. On the conventional (if not very reliable) measurement of wealth, gross national product per capita converted to a common basis by the use of international currency rates, Sweden, West Germany, Norway, and the Netherlands usually come out higher on the table than Canada, while the rest are usually somewhat below.

Finally, the sample countries resemble Canada politically, all now

having similar political systems with governments determined by elections. And in terms of religion and social customs, differences are more a matter of degree than of kind, with the exception of Japan, whose inclusion in the sample was desirable because of that country's reputation of having found the secret of successful industrial planning.

**Definitions**

The debate over a strategy of targeting winning industries is bedevilled by confusion over terminology. Palda[3] and others have exposed the fuzziness of the term "high technology" which is in general use, showing that application of the most plausible definitions (high value added per employee, large amount of capital in use, large number of scientists employed, high risk involved, or short duration of the life cycle of the product) leads to the discovery that the industries which satisfy the criteria best are seldom those that people have in mind when they use the term. (Agriculture, for instance, qualifies the best on some criteria, while industries like aeronautics may well be excluded.) The Science Council of Canada does not attempt a definition. It merely provides a list of types of products that it considers "high technology"—a list containing such strange bedfellows as man-made fibres and heating equipment, coal products and railway rolling stock, and tools and chemicals[4]—without indicating the criteria used in the selection.

Another and most important confusion is that when referring to "high technology" industries, sometimes the debaters are talking about industries that produce "high technology" products (whatever they may be), and sometimes about industries that use such products in their productive processes, even though they may be mature, slow-growth industries.

In this monograph the term "winning industry" will not be defined as an industry that is involved in something called "high technology," but rather an industry that produces goods the world demand for which is expected to increase more rapidly than the world demand for other industrial products, and one that has good prospects of being able to operate in Canada and compete successfully with foreign producers of similar goods. A "winning industry" will therefore be taken to be a high-growth industry, whatever it produces and however it does it.

The word "industry" is also used loosely in general speech. Sometimes it merely means an industrial firm, as in "a new industry is moving into the local area"; at other times it is used in the traditional economic sense of a group of firms making similar products, as in "the automotive industry." Sometimes, also, it is thought of as encompassing various activities, including not only manufacturing but also mining (the coal mining industry, for instance), agriculture and even services (the "airline industry," for example). In this monograph the term will be taken to denote a group of manufacturing firms making similar products. (If an individual firm manufactured a product quite different from those of any other firm, it would be an industry by itself.)

Finally, "targeting" winning industries will be taken to encompass the whole process of discovering which industries are likely to be winners and then taking whatever action seems sensible to help them to develop more rapidly than they otherwise would.

"Targeting winning industries" therefore will be taken to imply earmarking, and taking action to stimulate, specific groups of manufacturing firms that make similar products the world demand for which is expected to grow rapidly relative to the demand for other manufactured products, and that promise to be able to operate in Canada and be competitive with producers elsewhere in the world. This should not be taken to imply particular reverence for manufacturing or the superiority of one definition over another. A clear definition is important if confusion is to be avoided, and that adopted here seems to correspond with what people involved in the debate about targeting winners usually mean.

**The Data**

The information sought in the survey was:

- the degree to which governments in the countries surveyed have followed a strategy of targeting winning industries within their jurisdictions
- the reasons for their following, or not following, such a strategy
- and, where a strategy of targeting winners has been followed,
  - what criteria and methods have been used to select the industries

- which industries have been selected
- what incentives have been offered, and other measures taken, to encourage the development of the industries selected
- what results have been achieved by the strategy.

**Methodology**

Although to target winning industries, or not to do so, is a question fundamental to government industrial strategy, literature on the subject is sparse. In Canada, the Science Council of Canada has been publishing reports on it since 1977, and a few responses have been made; and elsewhere a small amount of publication has taken place. It is, however, not sufficient to give a clear idea of what the official experience in this matter has been here and abroad. Consequently, the research upon which this monograph is based had to rely upon unpublished reports, newspaper articles and some seventy interviews, mostly personal but a few by telephone, with members of the public service and other public bodies, university staff and business people in the countries surveyed.

Such methodology cannot yield demonstrably reliable results. Verbal communications tend to be impressionistic and are often given in confidence, so they seldom yield precise data that can be attributed to an accepted authority. But to examine the situation in ten countries in sufficient detail to permit the drawing of unchallengeable conclusions would be a herculean task far beyond the time and resources available.

Causation is often difficult to determine by this or any other research method. Even if a strategy of targeting winning industries in a certain country is followed by an expansion in the industries concerned, one cannot necessarily be confident that the strategy causes the expansion, since changes in other economic circumstances inevitably take place at the same time. Consequently, in testing the hypothesis that a strategy of targeting winning industries will cause the Canadian economy to expand more rapidly than it otherwise would, one will never obtain incontrovertible evidence; it is a matter of continuing to accumulate evidence, inconclusive though each piece may be, until a convincing case can be established.

**Notes**

1. Kristian S. Palda, The Science Council's Weakest Link (Vancouver: The Fraser Institute, 1979).

2. See for instance Albert Breton, A Conceptual Basis for an Industrial Strategy (Ottawa: Information Canada, 1974), and William Watson, "The Economics of Technology," Policy Options 4 (March/April 1983): 40-45.

3. Palda, The Science Council's Weakest Link.

4. The full list, appearing in John Britton and James Gilmour, The Weakest Link: A Technological Perspective on Canadian Industrial Underdevelopment (Ottawa: Minister of Supply and Services Canada, 1978), p. 198, note b is: man-made fibres; chemicals, petroleum and coal products; mechanical handling equipment, other industrial machinery; agricultural machinery; all locomotives and rolling stock; road transportation equipment; aircraft and parts; other vehicles; communications equipment; heating, refrigeration and air-conditioning equipment; measurement and control equipment; tools; office machinery; pharmaceutical supplies; and photographic goods.

## Chapter Two
## ATTITUDES TOWARDS TARGETING WINNING INDUSTRIES

### Canada

The attitudes of the Canadian provinces towards government intervention in economic affairs, for whatever reason, have conformed to the general political philosophy of their governments. The belief in laissez-faire has generally been strong in British Columbia and Alberta, in keeping with the outlook of the relatively conservative governments that have held power almost continually for many years. They profess confidence in the private enterprise system and concentrate primarily on trying to provide an infrastructure and a climate in which business can prosper. Much the same can be said for Ontario, though there have been waves of government intervention when governments have considered it necessary to apply "shots of oil" at various points because the provincial economy was temporarily not working as smoothly as it should. At the opposite end of the spectrum is Quebec, which has generally subscribed to the belief that the proper development and operation of the economy demands planning and direction by the state (dirigisme), though intervention has tended to be ad hoc in nature without systematic strategy, in spite of lengthy government policy documents put out in 1974 and 1979[1] by the Parti Québécois government. In between are the other provinces. All their governments are involved directly in the economic life of their jurisdictions, usually in response to crisis situations that make no systematic pattern which could be called a "strategy"; indeed, most are reluctant to admit that they lack confidence in the private enterprise system or that they

believe in state direction.

The difference between the laissez-faire and the dirigisme provinces has, however, tended to narrow due mainly to the pressure resulting from the economic difficulties Canada has been experiencing over the last decade. Philosophical attachment to laissez-faire tends to weaken when the system does not seem to be delivering the goods. Even in that relative bastion of free enterprise, Ontario, development co-operatives were established in 1973 (Ontario Development Corporation, Northern Ontario Development Corporation and Eastern Ontario Development Corporation), and pressure on the government to formulate an industrial strategy (though no one has yet produced a useful definition of what precisely that is) resulted in the Board of Industrial Leadership and Development (BILD) being set up to plan the province's industrial advancement and to operate, through nine ministries, various programs intended to stimulate the development of particular industries. It was this Board that produced a document[2] in 1981 which described a sort of industrial strategy (though cynics point to the fact that it was apparently written "off the cuff" in a very short time by civil servants under instruction to produce a document that could be available during the 1981 provincial election campaign, making the work more a political than an industrial strategy!).

In spite of differing provincial governments' political stances, the practice of singling out particular industries for special attention has been widespread. The most common type of industry has been the ailing ones—those that for one reason or other have fallen on hard times and appear to be in danger of contraction and perhaps complete demise, with the inevitable economic and social distress this would cause. The government of Ontario has targeted the automobile, furniture, pulp and paper industries, and a few others that fall into this category. In Quebec, similar treatment has been afforded to textiles, knitwear, clothing, furniture, and others. And the pattern has been repeated in other provinces—Nova Scotia, for instance, is deeply involved in steel and fish processing for the same reason.

Another common target for provincial governments is the resource-based industries (food processing in British Columbia and petrochemicals in Alberta, for instance). This presumably is based upon

the theory of comparative advantage, which declares that it is in the interest of countries and areas within countries to concentrate their efforts on producing those goods and services in which they have the greatest advantage relative to other countries, because of their resource endowment or for other reasons.

"Basic industries" are also frequently targeted, the term "basic" implying those industries that constitute the industrial base required to support the development of other industries. In its 1979 policy statement[3] the Quebec government, for instance, designated chemicals, petrochemicals and steel in this category.

Yet another target is industries that create linkages with others so that the output of one becomes the input of another. The Ocean Industries Subagreement between the federal and Nova Scotia governments is an illustration of industries being targeted for this reason, as was the Multiplex Corporation in New Brunswick.

Industries are also sometimes targeted by provincial governments for reasons of provincialism—because they provide desirable spin-offs to other industries in the province. The government of Quebec, for instance, targets for special treatment industries that buy all or most of their inputs locally.

Finally, targeting of industries sometimes has regional policy overtones. This occurs when provincial governments select for special treatment an industry because it is located in a relatively poor part of its jurisdiction and may reduce regional economic disparities if it can be made to expand.

While all these are instances of targeting of industries, they are mentioned here primarily to emphasize the need to distinguish them from the type of targeting with which this monograph is mainly concerned—the targeting of industries because they are expected to be winners. Debate about targeting often becomes confused because this distinction is not made.

Almost all provinces express an eagerness to target winning industries. Perhaps this is because it appears a smart, progressive thing to do—which means it is therefore a sensible policy politically; and there are a few instances of special programs (the BILD programs in Ontario are examples) being directed at particular industries because

they seemed promising. But no provincial government admits to being committed to confining its industrial development efforts to winning industries. Most programs directed at industrial development are general in nature (where they are not intended to prop up ailing industries), and politicians are reluctant to advocate a policy that implies giving less favourable treatment to industries that are not in the category of winners. However, there are some indications that, in the administration of programs, special attention is sometimes given to industries that are believed to be winners. Industrial promotion people in provincial governments seem sometimes to pursue firms in winning industries with extra energy and enthusiasm (it is said, for example, that Quebec chases pharmaceutical firms particularly hard) and to be prepared to process applications for financial aid more promptly and generously than they might for firms in other industries.

At the federal level, governments' views have conformed to no consistent pattern. Governments have seen their main tasks to be the wielding of the macro-economic weapons of monetary and fiscal policy, and the improvement and maintenance of the physical environment, so that the private enterprise system may flourish. The nearest thing to an industrial strategy was Macdonald's National Policy set down in 1879, which had the clearly stated objectives of binding the new country together economically and causing a manufacturing industry to develop in Canada, and a simple strategy of building railroads and installing high tariffs against imports. Of recent times, governments have usually claimed to have had an industrial strategy for guiding the economic advancement of the country—which is no doubt politically wise since they thereby have tended to give the impression that they have had a clear idea of the best path to tread and have been in control of the situation. Rather elaborate attempts have recently been made to arrive at an industrial strategy, starting in 1972, continuing through 1977 with the exercise called "Enterprise Canada 77," and the setting up of sectoral task forces in 1978 and subsequently. Success has, however, been elusive, politicians apparently backing off when it appeared that adopting any specific policy would likely bring down upon them the wrath of champions of those industries omitted from the list of those to be targeted.

The federal government has, of course, been involved as much in other sorts of industrial targeting as have provincial governments. Footwear, textiles, shipbuilding, automobile manufacture and others have been targeted because they have been ailing industries, and federal governments have often been partners with the provinces in targeting resource-based industries, industries that might be expected to provide the base for the development of other industries, industries that promise the benefit of linkages and spin-offs, and industries that are prepared to locate in the poorer areas of the country and may thereby help to reduce regional economic disparities. Nationalism also has been a particularly strong motivating force for federal governments, industries that might reduce Canada's reliance on foreign countries and foreign multinational corporations being targeted for special treatment. But none of these represent targeting because the selected industry is expected to be a winner compared with other industries. However, there have been isolated industries (the aircraft and nuclear industries are examples) in which a federal government has intervened partly because they appeared particularly promising. And about three years ago a small-scale operation was mounted by the Bureau for Business and Economic Development (BBED) in the (then) Department of Regional Economic Expansion, which is a pure example of an exercise to target winning industries. BBED's role has been to earmark potentially winning industries in Canada and help to ensure that all the benefits provided under the multiplicity of industrial programs are made available to promising firms in those industries, thereby encouraging them to grow more rapidly than would otherwise be the case. Though this operation is very tiny relative to the rest of the government machinery concerned with industrial development, it perhaps represents a timid acknowledgement that there may be some virtue in trying to target winning industries.

### Other Countries

The attitude of governments of the foreign countries studied varies greatly depending, as in Canada, mainly upon the political philosophy to which they subscribe. All have engaged in targeting industries for the usual reasons. Throughout Western Europe the textile, steel and

shipbuilding industries are very sick and continue to survive at their present sizes only because governments in the countries concerned have propped them up; and the Japanese steel and shipbuilding industries have similarly been targeted, though here the government policy has been also concentrating on reducing their size rather than just maintaining them. Industries are also targeted for various other reasons not very different from those applicable in Canada–because they are based on local resources, because they are thought necessary as a basis for the growth of other industries (the Japanese in particular took massive steps to build up their steel, chemicals and other heavy industries in the 1950s and 1960s for this reason), because they are likely to be important to the poorer areas thereby reducing regional economic disparities (Italy, for instance, has concentrated much of its efforts on trying to bring about the development of selected industries in the Mezzogiorno), because they may increase self-sufficiency in armament production and thus serve the ends of defence policy, because of economic nationalism (in the 1960s the French government supported the initiation of major projects primarily to secure national independence from the dominance of United States computer firms and reliance on other American technology.

In respect of targeting industries because they are expected to be future winners, three countries surveyed profess to be devoted disciples of such a strategy, while the rest profess the opposite.

## The Professed Targeters

The three professed targeters declare their conviction that a country will not develop economically at its maximum rate and in the most appropriate directions unless its government intervenes to exercise a guiding and stimulating influence–a philosophy of dirigisme.

The economic justifications advanced for their belief in dirigisme are five:

- Some projects in the national interest are so uncertain that no private enterprise company would be prepared to undertake them. This is particularly true of small firms whose resources are too small to enable them to face high-risk projects.
- Some projects have a very long pay-off period, which again makes

them unattractive to private enterprise firms.

- Some projects, if they are to be undertaken at all, must be embarked upon on a large scale (that is, there are "indivisibilities"). Again, this reduces the possibilities that such projects will be undertaken, particularly where small or medium-sized firms are involved.
- Though certain projects produce benefits to the economy that justify the cost of their being undertaken, some of the benefits do not accrue to the firms undertaking the projects. For instance, a firm setting up a new manufacturing facility that involves expensive labour training may not reap all the benefits—some benefits may go to other companies who draw off the workers once they are trained. (This is a situation involving "externalities.") The same situation may occur where surplus labour and other resources exist in the location in which a new manufacturing facility is proposed. The public cost of using such resources may be quite small and justify the project being undertaken; but because the private firm has to meet the full costs of using those resources, the project may seem unattractive and will not be undertaken.
- Government intervention in the private sector is necessary to counteract imperfect knowledge. Firms never know all the opportunities available to them and may therefore not undertake projects that may well be profitable. Again, this is particularly true for small firms, where the people directing the activities are often so engrossed in the day-to-day problems of the enterprise that they are unable to stand back and survey the opportunities available to them.

The three countries that profess to be targeters are France, Japan and Ireland.

France

In France, dirigisme has traditionally been the pattern, and in 1981 France was one of the only two members of the Organisation for Economic Co-operation and Development (OECD) to find themselves unable to endorse a staff paper that questioned the wisdom of

governments following policies of targeting winners. Soon after the Mitterand government took office, it decided that France must become industrially competitive and abreast of the newest technology. With this in mind, it became determined to revitalize the industrial structure, targeting winning industries. Mitterand visited Japan and was apparently fascinated with the Japanese "miracle." Though he has a reputation of being particularly naive in respect of technology and economics, he returned talking enthusiastically about microchips and other examples of technological innovation, and expressed himself determined to push France in the same direction. However, his government's commitment is not complete (or perhaps he and his colleagues are just politically astute) because it has been made clear that there is no intention of forsaking the non-winners.

Japan

Japanese governments have also traditionally believed in the wisdom of state intervention in their country's industrial life, and Japan was the other country that did not endorse the OECD staff paper. During the late 1940s, the 1950s and the 1960s, governments were very active in the economy and are usually credited with laying the basis for the growth of the industrial giant that Japan now is. However, the industries it then targeted were the basic industries that were considered a necessary prerequisite for the development of the automobile, micro-electronic and other industries which astounded the world in the 1970s. During the 1970s the Ministry of International Trade and Industry (MITI), which had master-minded the developments of the earlier post-Second World War expansion, lost a lot of its influence. Its main task became that of inducing its textiles, chemical fibres, steel, shipbuilding and other industries, whose spectacular growth it had engineered earlier, to contract and diversify their activities. The newer manufacturing industries that were becoming important never really fell firmly under the control of government. So the government's role became much more passive than it had been and its present official stance is that its concern is to ensure that market mechanisms have full play. Its influence is now less with targeting winning industries than encouraging the development of basic

technologies and removing market imperfections. The nick name "Japan Inc." sometimes applied to the Japanese economy has been far from appropriate for at least a decade, and may never have been that appropriate.

Ireland

The Irish government delegates the implementation of its industrial development policy to its Industrial Development Authority (IDA). Literature issued by the IDA invariably lists a number of industries that it views with particular favour because they possess especially desirable characteristics, including good growth prospects; so Ireland may properly be included in the group of professed targeters. However, representatives of the IDA agree that targeting winning industries is becoming a more and more uncertain exercise since the situation in individual industries can change very rapidly in response to external disturbances (oil crises, for instance), and technological progress can quickly change expectations.

Consequently, the IDA has adopted a very pragmatic approach. Though the representatives in the field are fed various analyses indicating the rates of growth of various industries and other such data, in fact their basic strategy is to discover from trade journals and other local sources of intelligence those firms, whatever industries they belong to, which appear to be prospering and thereby possibly considering expansion. They then use a "great deal of shoe-leather" (in the words of one informant). Staff are also on the lookout for possible opportunities in new developing activity. For instance, when oil exploration activity was proceeding in the North Sea, the IDA staff considered the various small operations in which Ireland could become involved as a supplier to the oil companies. Similarly, when it was observed that automobile companies were attempting to make their components lighter and lighter, the IDA looked for components which could be made of new material by processes that could be carried on in Ireland. Other examples of this type occurred in the aerospace industry (again, there was a trend towards lighter components), and in the engineering industries (where there were opportunities for making small parts from new lighter materials for aircraft engines). In the search,

care was taken to avoid becoming involved in the manufacture of products in which Japan had proved itself particularly competent and in which, therefore, Ireland felt it could scarcely expect to be competitive.

The IDA's official position that they target winning industries in their industrial development efforts consequently is more a public relations stance than anything else. While the particular sector to which a company belongs is of some importance, the IDA is almost never known to refuse an opportunity that appears to be viable and does not threaten undesirable side-effects. It is true that in the prosperous period in the 1960s it did become somewhat more choosy in the firms it accepted, but this was a passing phase and, in the present economic conditions, it is very glad to obtain anything that is available. Indeed, one observer expressed the opinion that, in fact, the IDA never had a policy of targeting industries. What happens is that its representatives go out and get whatever is available, and when after doing this for a period of some success, it becomes clear that it is attracting an increasing number of companies of a certain type, they then declare this was an industry which they had been targeting all the time.

The Professed Non-targeters

The other countries surveyed all belong in varying degrees of consistency to the camp opposing the philosophy of dirigisme, of which targeting winning industries is a part. The justification for their laissez-faire stance is usually in three parts:

- Bureaucrats and politicians are less able to determine opportunities than are the firms that operate in the market-place. Expansion of particular industries is not just a matter of expansion of future demand but also involves matching this demand with a country's resources and capabilities. They believe that civil servants and academics are too far removed from the business world to be able to make the judgements necessary to identify winning industries.
- The economic and business situation changes rapidly. What may be a promising activity now may well, in a relatively short while, be very unpromising. Yet governments and government departments

are slow moving and normally continue policies after the circumstances justifying their introduction have passed, and these outdated policies may then do more harm than good.

- There are great risks in spotting winners, and if government encourages business to go in a certain direction, it may well lead to bad business investment. If private industry is left to itself, firms will pursue various paths, and if one particular path is a blind alley, those following other paths may well be successful. Non-intervention of government therefore results in diversification of risk.

Leadership of this group is earned by West Germany, probably the most convinced and consistent opponent of a policy of targeting winning industries. Close behind are Sweden, Norway and the Netherlands. The remaining two, the United Kingdom and Italy, are somewhat wavering members.

West Germany

West Germany has had a history of authoritarian governments that played an important part in directing the economy, creating an environment in which power was concentrated in large cartels. However, since the Second World War, governments' attitude to economic activity has changed greatly, and from 1948 onward the idea of a planned economy has been rejected. Although a good slice of automobile production remains in the public sector, direct government involvement in economic affairs, except at a macro level, is small, confidence in the free market system is strong, and its governments have doubted the wisdom of government intervention in the economy, except to curb monopoly and restrictive practices and perhaps to ease regional economic disparities (though this is probably more aimed at political rather than economic goals). The West German government only belatedly and reluctantly allowed itself to be drawn into the game of propping up ailing industries (it eventually involved itself in its sick steel industry only when other members of the European Economic Community became committed in a big way to their steel industries, and primarily to put pressure on the others to abandon this policy), and its involvement is still on a relatively small scale. Frightened by the oil

crisis of the 1970s, because of its dependence on imported oil and gas, it has taken steps to try to accelerate the development of conventional sources of energy and to encourage energy conservation; and there have been a few other incursions into individual sectors of the economy. But there has been little attempt to discover and stimulate the development of industries with exceptional potential. There was a lapse in the 1970s when targeting was attempted by the Department of Research and Technology. The Department went through a great deal of money by providing research and development grants to selected sectors, including communications, electronics, space research and civil aircraft. The results were disappointing, however, and the Department and its policies are now discredited.

Sweden

The reputation of Sweden throughout the world is that it is a socialist country. In the sense that it has been a pioneer in welfare schemes, this is perfectly true but, measured in terms of output that comes from state-owned enterprises, its proportion at 8 or 9 per cent is very low by international standards. (Indeed, until a spate of nationalization of ailing industries in the late 1970s, the proportion was only 5 per cent.) Since the Second World War, Swedish governments have followed the liberal tradition, imposing a minimum of regulation and only intervening in the economy in a macro function. Such targeting as it has done has involved declining industries–shipbuilding, iron and steel, manual glass, forest industries, clothing, textile, woodworking, foundry and metal manufacturing–and there has been a good deal of propping up and restructuring of these industries. The Swedish government has, however, during the last five years, given considerable attention to the desirability of targeting winning industries, and it has commissioned or participated in six studies on the subject. One was by an American consulting group that recommended the installation of a system of state planning in which the government, industry and trade unions would play a large part; it pinpointed industries (some of the large ones on which Sweden's development had been based) that it urged should be left to decline; and it recommended that the government should target industries that could be expected to have a promising future and

concentrate its attention on these.[4]

This report stimulated considerable debate and a lot of opposition. No action has been taken on it and it appears now to be a dead issue. The basic reason for the rejection of the recommendations appears to be simply that the idea is against the Swedish tradition of placing the responsibility on private firms to make investment decisions and to choose what type of products to produce and what technology to employ. The role of government is traditionally seen as merely to provide a good infrastructure in which private enterprise can operate, and to make good any failures in the system. However, there were more specific reasons for this reaction to the consultants' report. Swedes remembered the period starting in 1968 when the government of the day embarked upon an ambitious program of sponsoring state enterprises, many on a very large scale. The outcome of this interlude was something of a fiasco and, of all the enterprises started at that time, only one or two small ones still survive. This led to the conclusion that governments are very likely to make mistakes in targeting winning industries. For instance, the government in the early 1970s was convinced that there would be a very good market in the future for semi-finished steel and proposed to build an enormous steel mill in the northern part of the country. However, by 1976, when a good deal of planning and site preparation had been completed, it became apparent that steel making throughout the world was in trouble and the project had to be abandoned. Opponents to targeting winning industries also quote the example of Volvo, the directors of which made a decision in the late 1970s to stay in the business of truck making even though, up until that time, all their success had been centred on the passenger-car side of the industry. The results have been exceedingly happy ones. Yet a government, faced with the decision at the same time, would very likely have decided that truck production was not a growth industry and would probably not have backed it.

The Swedish government consequently claims that it has no policy of favouring any particular sector. However, notwithstanding the official position on this matter, there are indications of an inclination to encourage the growth of particular areas because they seem to have high-growth prospects. The Swedish government has been involved

jointly with private industry in projects that are in industries generally considered as winners. And it is certainly true that the National Swedish Board for Technical Development (STU), one of the principal bodies concerned with stimulating research and development, makes budgetary provision for very much larger expenditure in some sectors than others. The Board is emphatic that its assistance is not limited to those sectors and it will be prepared to back suitable projects in textile and other slow-growth industries, but its spokesmen admit that one of the criteria for whether or not they should back a project is their assessment of the marketability of the product to be manufactured, which demands some idea of future market growth. (It should, however, be noted that large projects are dealt with by a separate investment board that does not attempt to second-guess large Swedish companies in their assessment of growth potential.)

Norway

For many years, Norway had a socialist government that espoused a doctrine of "economics for society." It became involved in setting up heavy industry, either in the government sector or by private enterprise with generous government assistance (many of which enterprises did not turn out well). It also has been very deeply involved with trying to rescue ailing industries. Like Canada's Atlantic provinces, it has a large number of small towns scattered along the coastline, each of which relies almost entirely on a single industry, usually fishing or fish processing, and the government found difficulty in allowing these communities to suffer when the industries on which they relied declined. An Industrial Fund that had been set up to improve productivity in the country became involved much more in propping up ailing industry; and even when the Fund's managers were reluctant to become involved, political pressure forced them to do so. As a result, about half of all industrial firms in Norway have received money from the Industrial Fund. An attitude, therefore, has tended to grow up in the country that the government may always be counted upon to bail out any industry in distress. However, towards the end of its life, the socialist government was having second thoughts about this policy, and the new conservative government has espoused a philosophy of leaving

the economic life of the country to the market-place, though it is having difficulty in extricating itself from many of the obligations and policies of the previous government.

There has been no increase in industrial production in Norway since 1975 and this situation has given rise to discussion about the appropriate economic policy for the government to pursue. There was much debate about whether the government might go in for targeting winning industries and a great deal of attention was paid to the report on this topic prepared for the Swedish government by the American consulting group. However, large sections of the community opposed the group's approach; they did not like the concept of the Norwegian government deciding which industry should be emphasized and pushing private enterprise in that direction. It was pointed out that the same people in government and its agencies who in the past had made mistakes in industrial policy would have to make future decisions, and they questioned whether a better performance could be expected in the future than in the past. There is also considerable doubt that, even if the Norwegian government could spot winners, it could exert enough influence on the Norwegian private sector to push it in the desired direction, since relations between government and business are not close and Norwegian businesses and labour have never shown any eagerness to comply with government wishes.

The debate still continues on this matter, it being pointed out that, for instance, Norway has only one hundred research personnel and someone (which really means the government) should decide priorities. However, there seems no likelihood that the government will, in the near future, adopt a strategy of targeting winning industries.

Netherlands

In the Netherlands, governments have tended to take a laissez-faire approach to the country's economy and have made no serious effort to target winning industries. The present government professes a belief that private industry is in a better position to decide future prospects for particular products, and it has limited intervention to rescuing steel and aircraft production. Immediately after the Second World War, the government did adopt targeting in the sense that targets were set for

each industrial sector, but no selective incentives were put in place to attempt to stimulate growth in those sectors. In 1980, a "spearhead" policy was inaugurated, which provided that the government would use regulation and its economic power through public purchasing to aid promising industrial opportunities that had a very long-term pay-off and might not, therefore, be initiated by private industry. However, this policy was very short-lived and was aborted in favour of a scheme advocated by an advisory commission that was set up in January 1981. This commission[5] attempted to specify sectors in which it saw particularly good growth opportunities in the future, and recommended a three-phase approach to industrial development. The first phase would be to identify strengths and weaknesses of the Netherlands that determined what the country could build upon. The second phase would be to identify specific industries and to indicate their prospects and the possible threats to them. The third phase, which the commission made clear was something that had to be left to private enterprise, was to identify certain specific projects that would be developed.

The report of the commission listed fourteen industrial sectors that it considered had "exceptionally good" prospects. However, the list includes virtually all manufacturing industries and therefore it cannot really be said to indicate specific targets. It is true that it listed a number of possible specific activities within these sectors, but it made clear these were no more than examples that occurred to it.

The significance of this report, however, is that it does advocate a more interventionist policy on the part of the Dutch government. The government is planning to hold discussions with particular industries (for instance, the industries concerned with offshore development, biotechnology, electronics and fine chemicals) to discuss how the government can assist their research and development. It has indicated it may be willing to subsidize research and development, particularly where there are groups of firms who, individually, are too small to initiate research and development on their own, but might do so co-operatively. The government has made it clear, however, that it does not consider itself committed to assist any specific sectors and that it believes that niches occur in all sectors, as can be demonstrated by the success of some well-managed Dutch textile firms. It points to the

great heterogeneity of sectors, which precludes generalizations about them and makes sectoral policies, as such, undesirable.

United Kingdom

British governments have not gone very far with planning the economy—either out of political conviction (like the present government) or of a lack of confidence in their ability to pull it off successfully. But they have intervened to indicate the directions they wished industry to go, they have provided incentives of various kinds to try to stimulate the general economy, and they have been deeply involved for over half a century (with some success) in regional development. They have also, until the coming of the Thatcher government, expressed themselves in favour of encouraging the development of industries that appear to hold particularly good promise for future growth. For instance, in 1968, the government used pressure to bring about the creation of a national computer company and provided support for it; in 1975 it established the National Enterprise Board with the expressed intention of stimulating the growth of high technology industries; and it also introduced a scheme directed at micro-electronic firms.

The present U.K. government is philosophically opposed to the idea of steering business activity, apparently being convinced of the futility of predicting the future and satisfied that the judgement of private enterprise is superior to that of bureaucrats; nevertheless, though it has reduced aid of a general nature to industry, it has continued to favour certain industries and has introduced new programs to assist them. This seems to result from a lack of confidence in the market system always to achieve results consistent with the national interest (notwithstanding its philosophical disposition to believe otherwise) since it explains that "without government assistance, the micro-electronics supply industry in the United Kingdom is unlikely to develop sufficiently quickly, largely because of the high risks involved,"[6] and "The role of the taxpayer...is to assist in bringing forward development and accelerating the introduction of new technology through improving awareness by providing some financial assistance to innovative firms."[7]

Quite apart from the explicitly stated policy, targeting is probably affected to some extent by the way programs are administered. Though some of the programs in place in the United Kingdom are general in nature and any manufacturing firm (and sometimes service firms) may apply for incentives, applicants are administratively screened in respect of their viability, their need of incentives to carry out the proposed projects, and their effects upon the economy. So there is plenty of opportunity to give preferential treatment to industries believed to be winners, if that is desired. The Northern Ireland Department of Commerce claims that it does just that, though one observer described this statement of policy as a "statement of hope," since, except for a short time in the 1960s, the Department has been desperate for results and glad to take firms from any industry eligible for financial assistance under the regulations. When the Department appears to be successful in obtaining a cluster of plants in one sector, it claims that it is its policy to target that sector (a ploy similar to that used by the IDA in Ireland). For instance, in the 1960s there was a large inflow of man-made fibre industries and the Department then announced that it was its policy to target selected textile industries.

Other administrative action is also taken in the United Kingdom that makes non-selective schemes selective to some extent. The Scottish Development Agency has a list of industrial sectors it favours, mostly because they appear to have good prospects for growth in Scotland, and its promotional activities are directed to these sectors, other sectors being relatively neglected.

The attitudes of governments in the United Kingdom towards a strategy of targeting winning industries have thus fluctuated according to their political complexions, but even the present staunchly non-interventionist Thatcher government is nowhere near as laissez-faire in this matter as it makes out.

### Italy

The Italian government has been heavily involved with industry. Indeed, in Italy the public sector constitutes a higher percentage of the whole economy than in any other Western European country, extending into

banks, radio, airlines, telephone and cable, steel, shipyards, engineering and many other large areas, all activities being operated by holding companies that report to the Minister of State Participations. However, since 1946 official industrial strategy has been less concerned with targeting winning industries than with a regional policy of trying to stimulate the development of industry in the Mezzogiorno, Italy's pitifully poor southern region that houses a third of its total population.

An attempt was recently made to earmark industrial sectors that might be particularly promising. A consultative committee was set up that eventually produced a list of growth industries but, since the list comprised all sectors in which there were large Italian firms, it was much too all-encompassing to be of any assistance. The official line now is that it is exceedingly difficult to pinpoint even winning projects beforehand since so many factors, including management competence, are so important. Nevertheless, a recent law for Industrial Reconversion and Restructuring has provided funds to cover up to 60 per cent of the cost of applied research for projects of high risk—which might be interpreted as the government targeting industries of the type usually assumed to be winners.

## The General Pattern in Other Countries

Though the foreign countries studied at first appear to fall into two groups, those that target winning industries and those that do not, the picture is less straightforward than that. Though France and Japan are outspoken disciples of such a strategy, the former asserts a determination not to desert non-winners (a necessary condition for a coherent strategy of targeting winners), while the Japanese main targeting efforts occurred in the first two post-war decades and were directed at "basic" industries rather than at winning industries, and its more recent activities have been concerned with stimulating general technological progress, rather than concentrating on particular industries. And though the Irish would claim membership of this club, they really adopt a pragmatic approach when it comes to the application of this strategy.

The other countries, though officially philosophically opposed to targeting winning industries, all follow such a strategy to some extent,

the extent varying from very little in the case of West Germany to a great deal in the United Kingdom.

**Notes**

1. Quebec, Une politique économique québécoise (Quebec: Ministère de l'Industrie et du Commerce, 1974) and Quebec, Comité ministériel permanent du développement économique, Bâtir le Québec (Quebec, Le Comité, 1979).

2. Ontario, Building Ontario in the 1980's (Toronto: Board of Industrial Leadership and Development, 1981).

3. Quebec, Bâtir le Québec.

4. Boston Consulting Group, A Framework for Swedish Industrial Policy, mimeo. (1978).

5. Netherlands, A New Spirit for Industry (The Hague: Advisory Commission on Industrial Policy, Ministry of Economic Affairs, 1981).

6. Organisation for Economic Co-operation and Development, 1979 Perspective Review of Economic Policies (Paris: OECD, 1979).

7. Organisation for Economic Co-operation and Development, 1980 Perspective Review of Economic Policies (Paris: OECD, 1980).

## Chapter Three
## PICKING WINNING INDUSTRIES

If a policy of picking winning industries is to be followed, selections must be made—some industries have to be pinpointed as winners and accepted, while others must be rejected. This process of selection may be done either using statistical techniques or on the basis of judgement, or a mixture of the two.

### Canada

Most provincial governments, often in association with the federal government under the General Development Agreements, have studied the potential of particular industries in their jurisdictions, but none appears to have undertaken systematic studies designed to discover which industries promise to be winners and which do not. The choice of industries, where indeed a choice has been made, has been largely intuitive. Reference was made previously to the quick exercise upon which the Ontario Board of Industrial Leadership and Development (BILD) based its choice of industries it intended to target because they appeared to have particularly good prospects. BILD's list included micro-electronics and biotechnology. These are also mentioned by other provinces, together with aerospace, health care products, forest products, petrochemicals and others.

One has to look at the federal level to find a really systematic attempt to identify winning industries. This was carried out by the Bureau of Business and Economic Development (BBED) in 1980 and 1981. It laid much stress upon opportunities for import substitution and

figures for imports into Canada in 1979 were analysed.[1] The 12 000-odd classes of products, produced by firms in 144 sectors, were reduced to a manageable size by a filtering process. The first filter eliminated all sectors other than secondary manufacturing, all with old technology processes or known to be declining because of changes in technology, those in which there was already a great deal of government involvement, and those whose values of imports were less than the average for all sectors (on the grounds that smaller volumes did not justify further attention). The surviving sectors were further reduced by filtering out those with growth rates of 10 per cent or less between 1977 and 1979. Twenty sectors, accounting for about one third of total imports, then remained.

Analysis then went to the subsector level of which 735 subsectors belonging to the remaining 20 sectors were identified. Those subsectors not exhibiting particularly good rates of growth between 1977 and 1979 were eliminated, as were 11 other subsectors for various reasons relating to their size, structure, age, pay-off time for investment, and the extent of existing government investment. At this stage, the exercise was less statistical and more judgemental. Sixty-nine subsectors remained after this process.

Firms in these subsectors produced 642 commodities. These were subjected to filters similar to those used for sectors and subsectors. One hundred and two commodities survived.

The survivors were then regrouped into sectors:

- office machines and equipment (9 commodities)
- measuring, controlling, laboratory, medical and optical equipment (10 commodities)
- communications and related equipment (17 commodities)
- agricultural machinery and equipment (6 commodities)
- special industries equipment (16 commodities)
- drilling, excavating and mining machinery (12 commodities)
- conveyor, elevating and material handling equipment (6 commodities)
- general purpose industrial machinery (12 commodities)
- iron, steel and alloys (11 commodities)
- miscellaneous (3 commodities)

The ten commodities with the highest import values were:

- computer equipment, not elsewhere specified, parts of
- electronic equipment components
- loader, front end integrator, excav., wheel type
- drilling machinery, oil well rotary type, parts
- semiconductors, not elsewhere specified
- integrated circuits
- combines, agricultural parts and accessories
- computer equipment, not elsewhere specified
- plates, carbon steel, not elsewhere specified, 60" - 100" wide, cut length

There are, however, a number of serious shortcomings of this technique:

- Official statistics inevitably are stale by the time they become available. This is a very serious disadvantage, since the situation in industrial sectors small enough to be meaningful for policy purposes is often highly volatile and stale statistics may be unreliable or, indeed, even grossly misleading.
- Even if statistics can be obtained which are sufficiently fresh that they represent the situation at the present time, there is never any guarantee that past trends will be continued in the future.
- "Industries" are merely statistical concepts created for the convenience of statisticians. Every statistical industry inevitably contains a heterogeneous collection of establishments making widely differing products with varying degrees of success. It is true that this problem tends to be reduced as one disaggregates the data more and more, but it cannot disappear until one finds oneself dealing with industrial products rather than industries. Long before this state can be reached, statistical limitations are encountered because of the confidentiality rule imposed on Statistics Canada. As a result of this problem, statistical methods such as the one used by BBED throw up winning "industries" each of which is an aggregation of separate and dissimilar industries, some of which satisfy whatever criteria one has taken to define winners and some of which do not. It is entirely conceivable that a winning "industry" indicated by the analysis would be an

agglomeration of more narrowly defined industries of which the majority would be losers.

Even if, in spite of all the difficulties just discussed, it did prove possible to pinpoint winning industries at a level that is sufficiently disaggregated to be useful for policy purposes, one has only gone part of the way. Analysis and judgement may well show that the future market in Canada for, say, robots is very promising, but this alone does not make it advisable for governments to attempt to create a robot manufacturing industry in Canada. This represents only a forecast of future demand in a particular industry in a particular area. The conditions of supply also are of obvious importance and one must consider whether an industry expected to expand rapidly in the future is suitable for the resources, the skills and other circumstances of the country. If the goods of this "winning" industry could only be produced in Canada at high cost, and long-term government subsidies would be necessary to keep production going, then it would normally be unwise to attempt to stimulate its development. Import substitution methods often rely on the assumption that a big and growing local market for certain imports into Canada provides particularly good opportunities for local manufacturers to produce and sell the goods concerned profitably. However, a high and increasing level of imports may merely be an indication that Canada is an unsuitable location in which to produce products of this type and domestic producers are losing ground.

The statistical techniques based on import substitution are therefore unlikely to yield reliable results. They must inevitably be supplemented by judgements, and the inevitable question is, if researchers and managers of Canadian businesses in the industries concerned cannot make informed judgements about the prospects of profitably producing and marketing particular products, are bureaucrats likely to do any better?

### Other Countries

As is the case in Canada, techniques of picking winning industries in the other countries surveyed are a mixture of statistical techniques and judgemental methods. No country uses just one or the other; all employ a mixture, but the mix differs considerably.

France

The French probably adhere most closely to the statistical approach. In the 1960s, its winners were data processing applications and microprocessing, scientific and medical instruments, integrated circuits in electronics, numerically controlled machines, nuclear energy and data processing. But its most recent winner-picking exercise was a very elaborate sectoral analysis carried out by CODIS (Comité d'Orientation pour le Développement des Industries Stratégiques), an interministerial committee set up in 1979 and presided over by the prime minister. Its starting point was 600 industries that had been studied in the mid-1970s by the Ministry of Industry. Each was judged according to thirty-three quantifiable criteria grouped as follows:

| Criteria | Number of Variables |
|---|---|
| Future world demand | 1 |
| Future French demand | 1 |
| World competition | 6 |
| World specialization | 6 |
| French specialization | 2 |
| Industrial constraints | 5 |
| - productive capacity | |
| - research and development effort | |
| - manpower availability | |
| - supply sensitivity | |
| - market coverage | |
| Economic constraints | 5 |
| - profitability | |
| - value added per employee | |
| - technological level | |
| Job creation | 1 |
| Economic self-sufficiency | 3 |
| Potential for involvement of French industry | 3 |

After employing these criteria and taking account of the fact that the French government had decided to adopt a long-term outward-looking strategy (as opposed to following a policy designed to achieve French independence), fourteen industries were selected, of which the

following five were earmarked for initial attention:

- energy (oil field equipment, nuclear power stations, petrochemicals, etc.)
- electronics (telecommunications, computers, micro-electronics and office machinery)
- aerospace
- mechanical engineering (new materials, automated techniques, robots, flexible engineering systems, numerical control)
- biotechnology (in the pharmaceutical, chemical, food, metallurgical and liquid fuel-producing industries).

Since several of these are not industries but rather activities that affect many industries, and could not therefore have very well been thrown up by a sectoral analysis, one is led to suspect that political considerations were influential in deciding on the final list; indeed, it is known that "major innovations in textiles" was formally added subsequently in response to political pressure.

The Eighth Plan eventually listed the target sectors as telecommunications, aviation and space, underwater technology, new engineering technology, and biotechnology. Finally, the interim plan for 1981-83, produced by the Mitterand government when it came to power, listed the space program, civil aviation, telecommunications, nuclear energy, exploitation of underwater resources, biotechnology, robotics and machine tools, and energy utilization and new forms of energy.

Japan

The Japanese technique for picking winners is partly theoretical and partly the result of a complicated consultative process. On the theoretical side, the Japanese, whose public servants are not afraid to use modern statistical techniques to achieve the results they want, produce proposals for subsequent discussion. They are aided in this by a very excellent information-gathering system and statistics that are much more detailed and up-to-date than any in North America. The consultative mechanism then comes into action using very many committees, organized by sectors. Each committee has representatives from the industries concerned, from the academic community, from the banking industry and from various government groups. The Ministry of

International Trade and Industry (MITI) and the Ministry of Finance alone have some 300-odd consultative committees. The consultative committees at various levels consider the proposals and amendments are made in the light of criticisms. Further discussions take place in trade associations. (In Japan, trade associations are very powerful; indeed, the Federation of Economic Organization (KEIDANEN), the central organization for all trade associations, is so influential a body that it is often referred to as the "business cabinet"). Eventually, this consultative process results in a consensus about which the future winners will be.

Out of this process came the many products that have made Japanese technology known and reverenced around the world, including automobiles, calculators, transistor radios, and the many other electronic consumer durables. Also targeted were heavy electrical equipment such as turbines. Recently, the Japanese government has issued new lists of targets under three categories—new industrial materials, biotechnology and "new function elements" (semiconductors). In these categories are included a large number of commodities, including fine ceramics, high efficiency substance-separating membrane materials, electrically conductive high polymer materials, high crystalline high polymer materials, high efficiency crystalization-controlled alloys, compound materials, bioreactors, massive (biotechnical) cell cultures, gene recombination application technology, super-lattice (exceptional atomic structure) (electronic) elements, three-dimensional (electronic) circuit elements, and electronic elements intensified in anti-environmental resistance.

Ireland

As described earlier, the Irish approach to picking winners is entirely pragmatic. The Industrial Development Authority (IDA) tends to cast its industrial promotion efforts widely to include any firms that might be induced to set up plants in Ireland and, when it is clear which industries have been attracted, they are officially adopted as target industries.

The list has varied over time but of recent years has included such industries as electronics, high-quality textiles, mechanical engineering

and consumer goods (for instance, photographics, do-it-yourself equipment, sports goods and leisure equipment).

West Germany

During the lapse previously mentioned, when West Germany through its Department of Research and Technology embarked upon a short-lived exercise of targeting winners, the industries selected as potential winners included communications, electronics, space research and civil aviation. How these industries were chosen is not generally known, but complaints have frequently been made that the selection was on the basis of faulty analysis. Since the failure of this exercise there has been no official policy of choosing winners, though the federal government has put up considerable amounts of money for research and development into priority areas that include information technologies, technical communication systems, electronics and space research, though these are not directed very specifically to individual industries.

Sweden

In Sweden, the National Swedish Board for Technical Development (STU) has done a little winner spotting, but the method employed pretended no sophistication. It was a matter of holding seminars and otherwise maintaining continuous contact with business and other sectors of society. In this way, STU believes it receives the appropriate signals about future developments in promising areas. In 1982 it said: "Sweden's future potential in manufacturing and its comparative advantages are in knowledge-intensive industries, characterized by high research and development intensity, advanced products and production technology, highly trained workforces, product quality and reliability, and an adaptability to specific consumer demands. The chemical industry and the mechanical engineering industry and, to an increasing extent, the wood products industries meet these criteria."[2] It also identified biotechnology, electronic materials development and health products.

Norway

There seems to be no indication that Norway has tried to pick winners.

As previously noted, it has expended most of its effort on propping up losers.

Netherlands

The commission in the Netherlands, which in 1981 advocated adopting an industrial strategy of targeting winners, did its selection in a very informal judgemental fashion, the industries chosen apparently being based almost entirely on the personal knowledge of the commission's members. It did, however, indicate the criteria it thought were appropriate. These included links with existing activity based on the country's comparative advantage, the existence of home markets for the products of the sector, and the link-up between the sector and existing expertise and knowledge. In addition, selected industries were supposed to be consistent with trends in market demand, with the present disposition of firms in the industry, with the ability of the industry to produce a high value added product, with the effects of the sector on the balance of payments, with the consistency of the sector and technological developments, and with demonstrated feasibility of projects emanating from the sector.[3] This is rather a mixed bunch of criteria, but some seem appropriate to a search for winners. The industries pinpointed by this approach included some of the usual ones—biotechnology, telecommunications equipment, optical equipment and fine chemicals—but the list was so general and far-ranging that a great deal of manufacturing industry was covered. It is therefore difficult to treat this as a serious attempt to locate winning industries—which is perhaps not too surprising since the commission deliberated for less than six months and had little secretariat to undertake research.

United Kingdom

In the United Kingdom during the mid-1970s a multivariate sectoral analysis was undertaken similar to that carried out by the French Ministry of Industry at about the same time. The U.K. analysis was based upon about 120 industrial sectors and over 300 product groups, incorporated 10 variables relating to performance, structure and world demand, and embodied sectoral reviews of performance and prospects. The winning industries selected by this method corresponded closely

with those thrown up by the French analysis (for instance, computers, pharmaceuticals, industrial plant and steelwork, scientific and industrial instruments and machine tools).

More recently, the British have adopted a selection by a consensus approach to winner picking. In the various sections of the Department of Industry (the Department charged with the responsibility of operating most incentive schemes for industry), there are technical specialists and others who believe, no doubt after research and use of the earlier sectoral analysis, in the special importance and prospects of certain industries, and they press for the adoption of policies that would encourage development of these industries. Since resources do not exist to do everything recommended, choices have to be made; and in the absence of any agreed, clear criteria that would make such choices routine, what used to happen was that some sections would win out by dint mainly of the forcefulness of their advocacy. To try to make the selection more objective, the Department has operated a sort of industrial parliament for the last three years, in which the various divisions put forward their cases in favour of their "winners," the final choice being made by a vote. The industries that have won out by this process are micro-electronics, mechanical and electrical engineering, computer services, biotechnology, fibre optics, and instruments.

This approach seems to imply that a meeting of individuals can, by voting, arrive at reliable predictions about the future that those individuals do not have the analytical tools to reach by themselves. This is not to suggest the choices are not sensible and defensible on good economic grounds (though the glitter of "advanced technology" and other areas of popular appeal may sometimes blur judgements), but merely that choices are based upon incomplete knowledge of the economy and must therefore depend upon the subjective assessments of those involved, whether taken individually or collectively.

Where general government policy making leaves off, administrative discretion takes over to define targets further. In Scotland, the Scottish Development Agency, which has a little money of its own to encourage growth in chosen sectors, picks its winners by a process it describes as "partly fortuitous, partly ad hoc and partly planned." It hired consultants in 1979 to investigate the prospects for

the electronics industry in Scotland (they reported favourably), used industry committees to examine possible future development, and looked at opportunities being created by research in Scottish universities, as well as doing its own "seat of the pants" assessment. As a result of these efforts they have a list of winners that includes electronics, health care and bioscience, and computer-aided analysis and design.

In Northern Ireland, the Department of Commerce has drawn up a list of some twenty-two industries upon which its representatives are asked to concentrate their promotional efforts. But since these industries constitute over 50 per cent of all manufacturing industry, all that has really happened is that certain industries have been eliminated because their prospects are considered rather hopeless.

Italy

The Italian government, though preoccupied with regional problems, has listed four industries to which it is prepared to afford special financial assistance, presumably because they promise to be winners. These include electronic components, computers, telecommunications, and automotive and electronic equipment.

The drawing up of this list seems to have followed the sort of procedure that is common in Italian governmental circles. A minister, or someone close to him, comes up with an idea, it is given to consultants to examine, and the government eventually receives a report, including comments by the bureaucracy upon the consultants' findings. It is a rather informal, pragmatic approach.

## The General Pattern in Other Countries

The scene therefore seems to be that all countries in the survey have to some extent made attempts to discover which industries are likely to become winners. Some have undertaken elaborate statistical analysis to try to locate the winners, while others have used more judgemental approaches. But no approach is completely analytical or judgemental; the former can only yield results if judgements are made, and no one would attempt to reach conclusions without the aid of some analysis. It is a matter of degree; Canada, France and the United Kingdom have a

stronger analytical base while the Netherlands and Ireland are at the other end of the scale, relying mainly on judgement. Political pressure inevitably influences the result. For instance, it is said that the list of industries eventually adopted by the French government after CODIS's elaborate exercise bore little resemblance to the collection of industries produced by the analysis.

Whatever the approach to this matter, the results seem remarkably similar. The favourites are micro-electronics, aerospace, biotechnology, computers, fibre optics, robotics, telecommunications, new industrial materials, health care and nuclear energy. Some encompass a wide range of dissimilar activities ("health care," for instance, includes pharmaceuticals, medical instruments and much more) and there is doubt whether they are sufficiently precise to form a basis for policy making. And even exercises which operate at the most disaggregated level that statistical information permits are likely to throw up "industries" that are really a collection of dissimilar industries, some of which may be winners and some losers. If foretelling the future were that easy, large sophisticated firms that have great pools of talent at their command would not make the blunders they do.

Notes

1. Canada, An Analysis of Trade Statistics, Canadian Imports, mimeo. (Ottawa: Bureau of Business and Economic Development, 1981).

2. Sweden, The 1981 STU Forward Look—Executive Summary (Stockholm: National Swedish Board for Technical Development, 1981), p. 22.

3. Netherlands, A New Spirit for Industry (The Hague: Advisory Commission on Industrial Policy, Ministry of Economic Affairs, 1981).

## Chapter Four
## BACKING WINNING INDUSTRIES

If, in spite of all the difficulties in pinpointing winning industries, it proves possible to produce a list of such industries, the next task is to put in place a strategy to stimulate their growth.

Governments in the countries surveyed all have a wide array of incentives and protection that they offer to manufacturing industries to try to help them to grow or to save them from decline. Manufacturing industries in Canada have a bewildering collection of programs of federal and provincial governments available to them, and an informant in France remarked that the French government offers "every incentive known to man." Even the government of West Germany, the least interventionist of all those surveyed, has accumulated a fair collection.

These programs provide for grants, loans, loan guarantees, equity participation, tax incentives, industrial parks and other infrastructure, and provision is often also made for protection from overseas competition by quotas, tariffs and (increasingly more important) non-tariff barriers such as preference in government purchasing. But many of these programs and much of the protection are non-specific, applying to any manufacturing firm to whichever industry it belongs, or are specific to an industry because it is a loser; and some are part of regional development policies that offer incentives to firms setting up activity in relatively poor regions. These are not specifically linked to a strategy of targeting winning industries. However, it should be noted that in some circumstances, they may form part of such a strategy.

First, in the administration of a non-specific program, the

government departments or agencies concerned may exercise their discretion in favour of firms in winning industries. Since many such programs (this is the general situation in Canada) are discretionary and rely upon a bureaucrat's assessment of the viability of the firm concerned, it is natural that a firm which belongs to an industry deemed to be a winner should receive more favoured treatment than one which belongs to an ailing industry with apparently poor prospects. And the speed with which the bureaucrats process applications for financial assistance may well depend upon the degree of enthusiasm with which they view the future of the applicants. Informants from several Canadian provinces confirmed that this was true in their provinces, and the final move by the Bureau for Business and Economic Development (BBED), once it has located appropriate firms in the industries it has designated winners, is to ensure that all benefits available under the various general programs of the federal government are offered to them to the extent believed necessary to cause them to develop in the desired fashion (a sort of one-stop shopping).

Secondly, no incentive is neutral in its applicability to different industries. An incentive offered to an industry to assist export activity is of interest only to firms that are exporters or potential exporters; and grants for research and development, the most popular form of incentive in the countries surveyed, are of importance only to firms that are large spenders or potential spenders on research and development, which often means the newer industries usually assumed to be the future winners. In Canada, the government of Ontario has set up centres of advanced technology, which are not specific to any industry but inevitably will benefit industries heavily involved in the type of research for which the centres are equipped, while the federal government and several other provincial governments have established research facilities and provided grants and other support for research not specifically directed to specific industries but nevertheless of primary interest to industries usually assumed to be potential winners.

Consequently, though we shall concentrate attention upon programs specifically directed towards winning industries, it should be remembered that others, ostensibly non-specific, may in fact be performing much the same job.

### Canada

In Canada, there are a few programs exclusively directed towards winning industries. The federal government set up a Special Electronics Fund in early 1982 to provide grants and other aid to manufacturers of electronic equipment, robotics and software, and is setting up micro-electronic centres across the country. In addition, it has provided financial packages to assist the nuclear, aerospace and space technology industries, presumably because they consider them potential winners. In Quebec, equity financing to joint government-private business is provided in growth sectors identified by the Ministry of Industry, Commerce and Tourism; and Ontario has paid in part for a demonstration project for Telidon, presumably because it believes that industry has a particularly promising future. However, the scarcity of programs specifically directed towards winning industries should not be taken to imply that federal and provincial governments are not willing to give special treatment to such industries; it is merely that any special treatment is meted out under the general, non-specific programs.

### Other Countries

All countries included in the survey give grants and loans for research and development, which are of most benefit to industries usually considered winners. Some countries encourage joint ventures with foreign firms to stimulate the growth of potential winners: for instance, Ireland has coaxed a French company to combine with an Irish company to manufacture advanced telephone equipment; the French have arranged marriages in computers with American firms; and there was the "Concorde" project between France and the United Kingdom.

Dissemination of technical and market information to benefit potential winners is encouraged by some countries. Germany does this energetically and gives preferential assistance for research and development where recipients undertake to make their results known, and the success of the Japanese microchip industry is said to owe a lot to the information fed to industry by the Japanese government.

Protection is used by some countries to stimulate their potential winners. The Japanese justifiably have the reputation of being masters

of non-tariff barriers; for instance, its barriers against the importation of automobiles constitute something close to prohibition, requiring disassembling and reassembling of vehicles in bonded workshops, with the delay and expense this entails. But other countries are far from innocent. France, for instance, effectively keeps out some Japanese micro-electronic equipment by insisting that it may be cleared for customs only at specified, small, isolated customs houses; and in 1982 Canada forced Japan to accept a quota in automobiles exported to Canada by imposing customs delays at Vancouver.

An even more common form of protection used by governments everywhere to stimulate the development of their potential winners (amongst other industries) is government purchasing policies. France has this down to a fine art with its "development contracts" between the government and selected firms engaged in specified research and development it requires, and its "purchase agreements" under which it undertakes to purchase the output of a firm that produces a commodity to its specifications.

Some governments also take upon themselves the task of finding and stimulating markets for products of winning industries. The French government went to the expense of building a light rail transit system so that foreign purchasers could see it in action. In Japan, when it became clear that the production of robots was outstripping the demand within the country and existing opportunities for export, the government set up a scheme that made it possible for small companies to rent robots. This has apparently successfully taken up the excess production. And the United Kingdom has installed computer-assisted design and computer-assisted manufacturing programs that seek to inform firms of the capabilities and advantages of computer-aided techniques for designing, planning, estimating, drafting, part processing and manufacturing and therefore tend to increase the sales of the winning industries.

A very important precondition of success when a government sets out to try to stimulate the development of an industry it believes is a potential winning industry is that it has the muscle to have its way. This depends mainly on traditional relationships between the government and industry. If the government plays a dominant role in

the economy, then the task is easier. For instance, the French government owns most of the banks and closely supervises money markets, and the public sector in France is large, including coal, gas, electricity, railways, tobacco and the country's largest automobile manufacturer. And it is important that the government has at its command a large and competent bureaucracy trained in appropriate disciplines. But most important of all is the relationship between government and industry. Norwegian business is of an independent frame of mind and is never inclined to kotow to bureaucrats.

Consequently, a Norwegian government does not find it easy to coax its industries to move in the direction it wants, and businesses in other Western European governments like to assert their independence. But again, at the other end of the scale, is France; many leaders of French industry have backgrounds similar to senior bureaucrats and received their education at the same universities, so the relationship between the bureaucracy and industry is rather close. This closeness is increased by the official practice of encouraging senior bureaucrats to switch frequently between the civil service and industry. As a result of this very close working relationship and the great deal of power it possesses, the bureaucracy has the ability to steer industry to a much greater extent than is found in most other Western countries.

Japan is in a similar position to France, but for a different reason. Japan is to a considerable extent still an organic type of society, in which people tend to respect authority and "know their places." Businessmen are motivated by a desire to conform ("it is the nail that is sticking up which gets hammered down") and are conscious of their position in the industrial hierarchy, rather like members of a family. They want to be liked and to avoid offence. This makes competing firms willing to comply with the wishes of government. The government therefore finds it easy to follow a system known as "administrative guidance." Within this system, mandarins can bully industries to contract and diversify and can encourage new ones to take their place. Such bullying may mean anything from a suggestion that a car manufacturer should think about setting up overseas plants, to thinly veiled threats that trading companies which buy oil from Iran may lay themselves open to government harassment. So if the

government picks out an industry as a potential winner, it has considerable power to induce it to expand in a required direction.

Chapter Five

# SUCCESS IN TARGETING WINNING INDUSTRIES

Any assessment of the success of strategies of targeting winning industries will always be tentative. Some of the strategies are so new that assessment would be premature, and a survey such as the one discussed here cannot produce a watertight case even if one existed. Official statistics are nearly always too highly aggregated to be of much use for this purpose. Gathering sufficient accurate information upon which to build a fairly convincing case, even for one instance of a targeted industry, would be time consuming, while to cover all the countries and industries surveyed would be a mammoth undertaking. Even if unlimited resources could be devoted to the task, an irrefutable case could not be built up since in any economic situation many variables will be relevant to the success or non-success of an industry. One could never be certain that an industry did badly because it was targeted or because of general world conditions, mistakes in other government policies in the country where it operated, actions of foreign governments (imposing barriers to prevent its exportation, for instance), imperfections in capital markets that starved it of capital funds, poor management, just bad luck, or some other reason.

However, governments must decide whether to target or not target and their decisions must be taken in conditions of uncertainty. All one can hope to do is to continue to amass pieces of information that, though unconvincing by themselves, gradually decrease the uncertainty and form the basis for intelligent decision making.

In Canada, the Bureau for Business and Economic Development

(BBED) has carried out the only really systematic exercise designed to locate potential winners and bring all the various programs into play to try to accelerate their development. Unfortunately, BBED's activities are only about three years old and judgement on their efforts cannot yet be attempted. However, the first firm in an industry that BBED picked as a winner was Mitel, a firm which a reasonably informed observer would have been likely to suggest as an obvious candidate without bothering with an elaborate analysis. Nevertheless, BBED's efforts did appear to cause Mitel to accelerate its expansion plans.

The other Canadian examples of governments setting their sights upon firms in industries that seemed to have promising futures do not present a very happy picture. Excursions into the nuclear energy field in the shape of the Candu reactor seem to have been reasonably successful from a technical point of view, but have been a commercial failure. In heavy water manufacture, an associated industry, technical and other difficulties created long delays and enormous cost overruns, and now that the plants are operational, no one seems to want heavy water and the plants are building up ridiculous stock piles to avoid the social implications of shutting them down. In the aircraft industry, the government in the 1950s sunk large amounts of money into the development of the Arrow, an aircraft which may have had certain technical virtues but which the intended customers did not consider good enough to buy. In the same industry it has become clear that the government investment of perhaps two billions of dollars in loans and guarantees in Canadair's Challenger 600 has produced an aircraft in less than one third of the budgeted numbers and even these can apparently only be sold below their cost of production; indeed, Canadair has the dubious distinction of holding the Canadian record for corporate losses, while de Havilland, another government protégé in the aircraft industry, is not far behind.[1] In computers, several large injections of public funds were lost when Consolidated Computers, one of the federal government's favourites, failed.

On the other hand, Ottawa is becoming something like another Silicon Valley, boasting a large number of manufacturers of micro-electronic equipment. Most appear to be receiving financial support from the governments of Canada or Ontario, or both, but it is not

possible to be sure whether their growth is the result of their being targeted by governments, or of the especially favourable environment created by Ottawa's large concentration of the public service.

The results of the French interventionist policy are very mixed. The nuclear industry, which the French government pushed rather hard in the 1960s, has done well though it had to swallow the bitter pill of adopting American technology when the nationalistic dream of developing a French-designed reactor had to be abandoned on economic grounds, even though the technical problems seemed to have been mastered. Roughly the same story applies to the aircraft industry, both in the civil and military fields, and France has sold a lot of jet fighters abroad. (The Concorde, however, had a less happy outcome.) Data processing, particularly the building of mainline computers, has been spectacularly unsuccessful despite the fact that the French government regarded this as one of the cornerstones in its policy of expediting France's technological development and leaving it independent of the United States. (However, it should be noted that failure to produce mainline computers is not limited to France, several other countries having had similar unfortunate experiences.) In electronics, results have been rather dismal and commercial viability has proved elusive, industries only being kept alive by government purchasing at grossly inflated prices and international sales effected more on the basis of political dealing than market competitiveness. Overall, the post-Second World War performance of the French economy has been good; indeed, in the 1960s it experienced a remarkable economic expansion, the rate of which was exceeded in Europe only by Italy, bringing France near the top of the list of the world's industrial giants. However, the expansion was on a rather restricted industrial basis in which aluminum and iron and steel featured prominently, rather than in industries that had been selected as winners. More recently, France's relative economic position has tended to deteriorate, with repeated depreciations of the franc.

The achievements of Japan are usually held up as the classic example of successful targeting of winners. Certainly, the post-Second World War performance of Japanese industry has been awesome. Japan has become the second most powerful industrial power in the Western world and holds leadership in many industrial fields. The goods it

produces are intelligently designed, well made, reliable and cheap. The question to be answered is whether or not these results came from a government strategy of spotting winners and then planning and implementing a policy which would ensure that they did in fact become winners. This is a matter that is very hotly debated, particularly in Japan itself. There are those who see the guiding hand of the government as having been quite indispensable in this process and point, as an example, to the research into microchips, initiated by the Ministry of International Trade and Industry (MITI), as one of the government's greatest successes. By March 1980, following four years of joint research by five leading electronics companies spurred on by MITI, Japanese firms were producing the most advanced memory chips in the world. And, if MITI has its way, this success will soon be repeated in the field of optical communication technology.

But other commentators see the situation quite differently. They argue that the Japanese success is the result of market forces operating in an environment congenial to business, the diligence of workers, energetic entrepreneurs, superior management skills and plain good luck, and was achieved in spite of democratic bungling. They claim that failures arising from government intervention in the private sector have been both costly and useless. For instance, in spite of heavy investment in petrochemicals, Japan still has none that are indigenous; unprofitable oil-importing companies have been stimulated by the government since 1965 without success; a large-scale passenger aircraft industry was planned up to 1960, but less than fifty units of the resulting WS11 were sold outside Japan, while the very costly designing of flying boats, which the Japanese government thought had a great future, has borne no fruit; and, in the nuclear industry, there have been many false starts over fifteen years to try to produce a reactor and it looks as if attempts have been abandoned. In the mainframe computer industry, almost no success has been achieved, though in small and medium computers during the last ten years the story has been reasonably rosy, and in large-scale semiconductors and integrated circuits the economy has done exceptionally well.

Critics of the government planning mechanism also observe that in the 1970s the power of the government directing agencies has

declined, as many of the Japanese industries have become more powerful and able to get along without government assistance. During this period, the enormous achievements of Japanese industry, probably the most spectacular of any period, must be attributable more to the private industries themselves than to any strategy of government. Certainly the world economic conditions of the 1950s, 1960s and early 1970s made the Japanese industrial miracle possible and there is great doubt if it could be achieved starting from the present time.

No doubt the truth lies somewhere between the two extreme positions. Some government initiatives (the memory chip example quoted above, for instance) have clearly been successful, though there have also been spectacular failures, and the Japanese government is not as omnipotent as is sometimes thought. Perhaps its greatest contribution was not in targeting winners but in creating an environment in which winners would arise spontaneously as the result of the energy and entrepreneurial spirit of its business sector.

It is worth noting that some of the countries that have been the slowest to adopt a strategy of targeting winning industries have been the most prosperous. The economic performance of West Germany, the greatest non-believer in targeting among the countries surveyed, has been outstandingly good since the Second World War, though it has suffered somewhat in the recent depression.

Sweden, perhaps next to West Germany in its reluctance to try to target winners, is invariably near the very top of the list of industrialized countries in all computations of current wealth per head of population. Its government has intervened to help potential winners to a limited degree and can claim success for its joint enterprise with Ericsson for the development of electronic telephone exchange equipment, which has been sold all over the world; and its partnership with Saab has been reasonably successful, though its original objective of producing mainframe computers has been no more successful than attempts in many other countries.

Norway has remained prosperous, with very high living standards and low unemployment, but this has nothing to do with targeting or not targeting winners—it is simply because it is enjoying its gas and oil bounty.

Italy has also enjoyed a high rate of industrial growth since the Second World War, particularly during the 1960s when the rate exceeded any other in Western Europe. But this cannot very well be attributed to a strategy of targeting winning industries since the Italian government's industrial policy has been primarily directed to reducing regional disparities, and only recently has it taken very tentative steps towards such a strategy.

Ireland, also in the category of non-targeters of winners despite claims to the contrary, enjoyed great success up to 1980—not so much in bringing about industrial expansion, but in restructuring its industry, substituting engineering, chemicals and certain other more prosperous industries for its traditional standbys of agriculture and textiles, and breaking its traditional dependence on the United Kingdom market. Its industrial promotion agency, the Irish Industrial Development Authority, was the envy of its opposite members in other countries. However, the country's drive for industrial development, which appears to have resulted from the impact of its entry into the European Economic Community, seems to have run out of steam recently, and it is now suffering economic stagnation with one of the highest rates of unemployment in Europe.

The performance of the U.K. economy in terms of growth and productivity since the Second World War has been so uninspiring that it has been overtaken in the prosperity table by most Western European nations. Some of its industries, the engineering and electrical ones, for instance, have done well and kept pace with progress abroad, but it is saddled with old declining manufacturing industries, including steel, shipbuilding, textiles and automobiles.

There therefore seems no correlation between a strategy of targeting winners and economic development. Japan, one of the two strongest supporters of the strategy, has achieved outstanding industrial growth; but then so has West Germany, which is the greatest opponent. France, the other main devotee to the strategy, has a very respectable record of industrial growth; but Sweden, a strong opponent, maintains its position near the top of the economic success ladder. In between are some countries that have done some targeting of winning industries and have growth records which are better than some that have done

little, and vice versa. Tracing the fortunes of targeted industries similarly leads to no firm conclusion. Some of Japan's industries have been outstandingly successful, but there is doubt that this was because they were targeted; and there is a lengthy list of industries which the Japanese seemed determined should grow but which have been disappointments. France's record has been very patchy with no indication that targeting an industry has generally resulted in its achieving growth and commercial viability. On the other hand, industries of the type usually considered winners have done well in West Germany, Sweden and some other countries that indulge in targeting to only minor extents.

Finally, one very important point needs to be stressed. One should not necessarily assume that a success has been achieved simply because an industry has grown as a result of a targeting strategy. A developed country can always bring about the development of an industry if cost is no object. The Canadian government could, by high subsidies, bring about a booming grapefruit growing industry in the high Arctic. The test is whether or not a targeted industry can be commercially viable at its expanded size and repay any subsidies and other public costs incurred during the expansion process.

**Note**

1. Disclosure in 1983 of the financial results of these two government enterprises was followed by the inevitable search for scapegoats. Politicians blamed management for the failures, since forecasts of demand for the aircraft produced by the two companies proved to be very wide of the mark. But this merely underlines the conclusion that forecasting the future is a hazardous exercise and therefore government strategies of targeting winning industries must inevitably be fraught with danger.

## Chapter Six
## POLICY IMPLICATIONS FOR CANADA

No government is completely satisfied with the working of the private enterprise system. Even governments in countries which are politically committed to that system intervene to try to mitigate some of its shortcomings. Government intervention in the working of industry is universal; even Germany, the most extreme laissez-faire example among the countries surveyed, provides incentives to try to induce its industries to do what they presumably would not do otherwise.

Thus it is inevitable that Canadian governments, whatever their political complexion, will seek strategies that will improve the performance of the country's industry. The prime concern must be to decide if a strategy of targeting winning industries is the most promising one, relative to other alternatives.

### Targeting Winning Industries

As Chapter Two pointed out, there are theoretically sound economic reasons why governments in Canada, like those in other countries, should lend financial support to industries in certain circumstances. If an economic activity involves high risk, a long pay-off period, a large size required to reach economic production levels, or benefits that accrue to the public but not to the firm involved, or there is a lack of knowledge about technological market opportunities, then the public interest may be served by the government using its financial resources to influence the development of the industry involved. These reasons may apply to industries of many types and may therefore sometimes

justify support for an industry because the government considers it a potential winner—one that may be expected to grow more rapidly than other industries. The word "may" has been used above because none of these reasons necessarily justify the use of public money to try to create winners out of industries that would otherwise not become winners. It would not necessarily be sensible for a government to back a very risky enterprise, since involving the public in risk is something that is to be avoided unless the net benefits expected subsequently to accrue to the public are big enough. (It should be noted that private investors evidently do not consider the risk worth taking, so public investors should approach the matter with caution.) Similarily, the Canadian public has a preference, as do business firms, for "pie now" rather than "pie in the sky by and by," and returns on public investment at some distant point in the future should be discounted by a factor large enough to reflect this preference before accepting that the investment is justified. Any benefits that accrue to the public but not to the firm must be large enough to justify the public investment. Finally, one should be sure that the government's technological knowledge and market predictions are superior to those of private business.

The main reason advanced for being apprehensive about Canada's economic future is that Canada's industrial structure is heavily weighted towards mature industries with poor growth prospects, and Table I certainly seems to confirm that this is so. But historically, in any country, mature industries always dominate. If one looks at comparative figures based upon the industrial breakdown used by the United Nations (see Table 3), the ranking of industries in Canada and Japan is not very different. The only great discrepancy is between paper and products and wood products, both industries based upon forest resources. This difference is simply because Canada is fortunate enough to possess great forests while Japan does not. (No doubt, if the Japanese had such resources, they would also be very glad to exploit them.) If these two industries are removed from the list, the ranking for the countries differs by more than two ranks only in respect of petroleum refineries (more important to Canada), electrical machinery (higher in table in Japan), and non-ferrous metals (more significant in

Table 3

## LEADING MANUFACTURING INDUSTRIES RANKED BY GROSS OUTPUT, CANADA AND JAPAN, 1979

| Industry | Rank | | | |
|---|---|---|---|---|
| | Canada | | Japan | |
| Transport Equipment | 1 | (1) | 1 | (1) |
| Food Products | 2 | (2) | 4 | (4) |
| Petroleum Refineries | 3 | (3) | 8 | (8) |
| Paper and Products | 4 | | 14 | |
| Metal Products | 5 | (4) | 6 | (6) |
| Wood Products | 6 | | 12 | |
| Machinery not elsewhere specified | 7 | (5) | 3 | (3) |
| Electrical Machinery | 8 | (6) | 2 | (2) |
| Iron and Steel | 9 | (7) | 5 | (5) |
| Industrial Chemicals | 10 | (8) | 7 | (7) |
| Non-ferrous Metals | 11 | (9) | 16 | (14) |
| Textiles | 12 | (10) | 9 | (9) |
| Other Chemical Products | 13 | (11) | 11 | (11) |
| Printing, Publishing | 14 | (12) | 10 | (10) |

Source: United Nations, Yearbook of Industrial Statistics, 1980 Edition, Vol. I, General Industrial Statistics.

Note: Figures in brackets indicate ranks if the wood products and the paper and products industries are excluded.

Canada simply because it has the great advantage of owning large deposits of non-ferrous ores). So, except that Canada refines more petroleum and Japan produces more electrical machinery, the differences in the structure of the manufacturing industry in Canada and Japan at the level of disaggregation provided by United Nations statistics are entirely explainable in terms of Canada's superior resource endowment, a matter that should hardly be regretted by Canadians. It is true that a different breakdown of industries might reveal significant differences in the industrial structure of the two countries (another possible example of the inadequacy of official statistics), but one must conclude that available data do not justify prophesies of gloom and doom or the introduction of new strategies to right imagined wrongs.

Even if one is satisfied that government intervention in the industrial affairs of Canada is justified, the question remains of whether or not targeting winning industries is the appropriate strategy. Is it a strategy that can be successfully carried out? There are grounds for considerable doubt on this point. As governments in Canada no doubt already know very well, forecasting the future is very difficult, particularly in those industries where technological innovation is rapid. Statistical methods are hindered by a lack of up-to-date statistics at a sufficiently disaggregated level, and available techniques cannot yield reliable predictions. (Business, like other facets of human life, has to operate in conditions of uncertainty, and no amount of statistical techniques can ever dispel all that uncertainty.) So forecasters will have to rely on judgements. But there is no reason to assume that Canadian businessmen with an intimate knowledge of the environment and operations of their industry should be less aware of growth prospects than bureaucrats, however intelligent they may be. It is also well to remember that the rewards for being right and the penalties for being wrong when backing particular industries are much greater for private sector decision makers than they are for politicians and civil servants, and this provides a very strong incentive to private businessmen to ensure that the decisions they take are right. In some countries (Japan is an excellent example), there is a great deal of consultation between government and business, but while similar

consultation in Canada may help bureaucrats to avoid some mistakes, there seems no reason to believe that the judgements made in this way would be any better than those the business people could make by themselves. (This is not intended to decry government-industry consultation. Governments can often avoid mistakes if they seek the advice of businessmen with detailed knowledge of industry. The point is that, in the end, people who work on a daily basis in a particular industry are likely to be able to make more reliable predictions for the future of that industry than can bureaucrats, even after consultation with businessmen.) Prediction by anyone calls for assumptions that may turn out to be far from the mark. For instance, estimates of the world demand for products of a particular Canadian industry (say micro-electronic products) rely upon assumptions about the actions of foreign governments, and such assumptions may be completely upset if those governments follow policies of forcing the growth of their micro-electronic industries, thereby causing a world glut within a few years. (This seems to be a very distinct possibility.)

Even if winners can be picked with some confidence, there would remain the difficulty of devising means to get them to develop in the required way. This would be particularly difficult in Canada. First, Canada is such a large country geographically, and its regions are so dissimilar, that uniform strategies throughout the country are unlikely to be very successful; yet designing and operating strategies custom-made to the needs and aspirations of individual provinces calls for a degree of agreement between federal and provincial governments on the appropriate strategy, which is not always easy to achieve. Secondly, there may well be conflict between a strategy of targeting winning industries and Canada's long-established regional economic policy. Over the last two decades, it has proved difficult enough to coax firms to set up or expand manufacturing activity in the country's poorer regions, even when any enterprise was welcome, so long as it held out reasonable promise of being viable. If government incentives were to be confined to firms in winning industries, the task would be next to impossible. And, thirdly, the relationships between governments and businesses in Canada are nowhere near as close as they are in Japan or France; indeed the situation is more like that of Norway, where

businessmen have an independent frame of mind and are not naturally inclined to fall in with the wishes of governments. Of course, businesses can usually be induced to do what the government wants them to do if the incentives are made large enough and are appropriately designed, but there are political constraints upon the size of incentives that can be offered, and controls which ensure that the incentives are used exactly as required and inspire an appropriate reaction are not always easy to devise.

If the difficulties of executing a strategy of targeting winning industries in Canada cannot be overcome, there is a distinct danger that such a strategy may do more harm than good. If the crystal ball gives the wrong signals, the government may accidentally back losers instead of winners. The effect of this could be devastating. While private firms in an industry may travel roughly similar directions, there will be sufficient diversity in their research emphasis and their product design to ensure some diversity of risk; if governments induce them all to follow a specific path that bureaucrats think promising, a failure may cripple all.

If governments in Canada lead an industry into this position, or for any other reason induce the expansion of an industry that appeared promising but turns out to be a loser, they are likely to be left with permanent invalids on their hands. Long-term and expensive propping up will often be inevitable since the social cost of allowing an unsuccessful industry to disappear quickly will often be politically unacceptable. Governments may be led into this situation by the "infant industry" theory that, like small children, firms sometimes have to be nourished and protected until they grow to a size when they can fend for themselves. In Canada, many manufacturing firms have been protected from competition by trade barriers for decades and still show no signs of being able to be independent, and similar situations can be found the world over. Infant industries very, very seldom grow up.

In order to shore up the losers they have created, a Canadian government might well feel obliged to take their products off their hands at prices that are higher than could be obtained elsewhere. While this is often politically acceptable because it appeals to Canadians' sense of nationalism, the public would still be paying for the

government's mistakes through higher taxes than would otherwise be necessary. At an earlier stage in the exercise, when governments are trying to cause a "winner" to expand, they might consider it expedient to provide markets by subsidizing the sale of the industry's products to the Canadian public. But, by doing this, they would be causing the public to buy products that it does not consider worth a price which would cover the costs of producing it, and would thereby probably divert expenditure away from products of industries that, left alone, could make a go of it. So the public would receive goods it did not want and perhaps would see the disappearance from the market of goods it did think were worth their cost of production.

Chapter Three described how the strategy of targeting winning industries may well lead to the neglect of very promising industries. Every Canadian "industry," so defined for statistical purposes, is inevitably a collection of dissimilar industries, some of which are likely to be winners and some losers. There are therefore likely to be winners within "industries" that are rejected as losers. This has been shown to be the case in France, the Netherlands and Italy where some firms are prospering by making textiles that satisfy specific markets, even though the textile industry itself is weak in all developed countries. It is well to remember that, had a policy of picking winning sectors or industries been in operation in Nova Scotia in the late 1960s, governments and their agencies would have turned up their noses at Michelin, since there was no basis for believing that automobile and tractor tire manufacture was an unusually high-growth industry; yet no other firm set up in that province since the Second World War, if ever, has had as much economic impact as has Michelin.

Perhaps the greatest danger of following a strategy of backing winning industries is that it may steer Canadian industry away from those industries in which it has the greatest cost advantage (or least cost disadvantage), industries that have provided Canadians with a very high standard of living. Advocates of such a strategy seem to imply that Canada can expand its winning industries without contracting elsewhere. It is true that, if there is unemployed labour, idle factories and other factors of production, this might be possible. But such a surplus of resources has come about due to an imperfection in the

private enterprise system; if it can be corrected, the question of how these resources should best be used is still open. There is nothing to say they should be used on the targeted industries in preference to others. Consequently, resources directed to the targeted winners must be at the expense of other industries—mature industries that have usually developed in the past because Canada has a comparative advantage by virtue of its wealth of resources and the skill and experience of its managers and workers. It is certainly true that, as situations have changed, the present structure may not be the ideal one for the country, but it would be very risky to abandon existing industries simply because they are mature and not categorized as winners, and adopt new industries in their place for which Canada lacks resources and expertise. It would be rather like saying to a Calgary millionaire beef farmer that he should get out of beef-raising because this is one of the most mature of all mature industries in the country. If he took the advice, he would sell his cattle, erect a small factory on his land and go into something like microchip production. It is conceivable that he would find that he had special abilities hitherto unsuspected which allowed him to become an outstandingly successful producer of microchips, and that his financial situation eventually might be better than it was while he was a beef farmer. But there is no logical reason to expect this would happen since his previous success demonstrated his ability to operate profitably in the cattle business, while there is no guarantee whatsoever that he would be particularly successful at producing microchips.

Based on the experience of the countries surveyed, and a comparison of the theoretical advantages that might follow from targeting winning industries in Canada with the difficulties of executing such a strategy successfully and the dangers lurking in the path, the conclusion is not reassuring. In respect of the industries that have had a high level of success (electronics in Japan, for instance, which are often held out as a vindication of targeting strategies), there is considerable doubt that their success was due to such strategies. And the record of post-war general economic development was certainly no greater in countries that adopted targeting than in countries that did not. There is a long list of targeted industries that have ended up as

losers, having to rely for their survival on large inputs of public money either in the open form of subsidy or in the hidden guise of government purchasing of their products at inflated prices.

Since the case in favour of targeting winning industries is far from proved, it may seem surprising that it is so readily accepted by many people in Canada and repeated as if it were self-evidently correct. The virtue of "high tech" industries as opposed to other industries appears to be taken as beyond dispute, as is the wisdom of spending a lot on research and development to form the basis upon which "high tech" industries will develop. Yet research and development costs are costs like any other and obviously should be kept to the minimum, consistent with a particular objective, and it makes no sense to rejoice at the idea of inflated costs or to deplore the evils of multinational corporations that do not spend as much as they "should" on research and development (incidentally, an assertion which research has shown to be very dubious[1]).

The ready acceptance of this philosophy by many Canadians, and the adoption of the jargon that has been created to go with it, are no doubt in part because of the influence of the Science Council of Canada. But there would appear to be other reasons. Individuals connected with Canadian companies that might expect to be included in the category of winning industries and might therefore expect to benefit from the subsidy and protection proposed are bound to support the thesis, since it is in their personal interests to do so. Also with vested interest are Canadian scientists, engineers and others who might expect to receive more remunerative employment or higher research grants from the public money that would flow if the proposed strategy were implemented. This is all inevitable; firms, and individuals whose fortunes are bound up with such firms, nearly always welcome government hand-outs and protection from competition and claim that their attitudes are inspired by the public interest.

One must have a great deal of sympathy for those Canadian bureaucrats who support the thesis. When the country started edging forward into the industrial development game, there did not seem to be much to it. All that appeared to be necessary was to decide the right thing to do, then for the government to put in some money, and the

economy would develop in the required fashion. However, things did not turn out to be as easy as that and the series of industrial development programs introduced have been much less successful than had been hoped. Yet every four or five years when programs reach the end of their lives or are due for review, bureaucrats are under pressure to come up with something that sounds new. There has therefore been a succession of seemingly new ideas wrapped up in jargon such as "resource-based industries," "modal points," "cornerstone industries," "infrastructure upgrading," "agglomeration," "growth centres," "forward and backward linkages"—all of which are sensible but none of which has proved to be the touchstone that would turn a somewhat backward industrial country into a thriving industrial giant. "Targeting winners" is just one of the latest, and one sees the associated jargon liberally sprinkled throughout government reports—"high tech" industries (even though no one seems to know precisely what the term means), "core industries" (those large "high tech" firms around which smaller "high tech" firms may be expected to grow), "truncated" plants (Canadian branch plants of foreign companies in Canada which do little research and development), and so on.

The thesis has considerable public appeal. It seems simple. "Back winners" (everyone loves a winner), "build on strength" (everyone admires strength) and other such slogans appear uncomplicated and consistent with everyday life, so the public can easily identify with them. It also appeals to economic nationalism, which is a prejudice inherent in the make-up of mankind generally, as is evident from the readiness of governments throughout the world to favour industries controlled by their own nationals, and one easily stimulated—a thesis that advocates bashing the foreigner and protecting one's own tribe is easy to sell. Perhaps it also appeals to the same sense of snobbery that causes many parents to steer their children towards white-collar occupations, even though they may, as a result, end up with poorly paying jobs or no jobs at all. And there is a popular misconception[2] that the industries favoured by those advocating a strategy of targeting winners will provide interesting, "self-fulfilling," jobs. This, however, is far from realistic; the production processes in these industries are usually assembly operations of a most routine and boring nature.

Another misconception widespread in Canada is that if everything is not right in the economy, something must be done about it. The situation cannot be left as it is; any strategy is better than no strategy. This is rather like a sailor marooned comfortably on an island becoming dissatisfied because he sees poor prospects of a growth in his living standard and diving into the ocean in the hope of being able to swim to a better island, even though the ocean is shark-infested and he is not sure that there is such an island within swimmable distance. Linked to this misconception is the excessive confidence some sections of the community have in the power of governments. If something needs to be done, the government has only to pass a law or regulation and it will happen. But those who observe governments throughout the world, even totalitarian governments, are invariably impressed with the limits of governments' power. Even in the Soviet Union, governments have had a long series of failures in agriculture, despite continuous attempts to correct the situation. In Canada, governments' power is limited by the elected parliamentary system, a diffusion of authority between the federal and provincial governments, and a tradition of resistance to government interference in business.

"Creating jobs" is another concept easily understood in Canada. Even if some of the alleged advantages of a strategy of targeting winners do not stand up to examination, what does that matter so long as jobs are created? But, if this were really the case, the objects would more easily be achieved by putting available public money into such traditional industries as leather, textiles and clothing that are labour intensive and would yield more jobs per million dollars of public expenditures than would the capital-intensive "glamour" industries. (It is interesting that the time-honoured criterion for judging success of industrial development programs in Canada has been the cost-per-job-created. On that criterion, the last thing government should do is to devote its resources to micro-electronics, biotechnology, and the like.) More jobs is not really what people want. If it was, the unemployed would be prepared to work for nothing, which is rarely the case in Canada. People are concerned about their standard of living and workers know that their standards improve if they have jobs; so, when they view "creating jobs" as a sensible objective, they really mean

"creating income." So the virtue of a strategy of targeting winners has to be judged by its ability to create income in response to an injection of public money (directly by subsidies or indirectly by government purchasing at high prices or protection from imports) compared with the ability of other industries to create income from a similar injection. Each case should be considered from this viewpoint; there is no reason to believe that "high tech" industries are necessarily superior in this respect.

One point the Canadian public may not realize is that a strategy of targeting winners carried out by subsidizing research and development (a very common method, as was seen in Chapter Four), transfers income away from the relatively poor by increased taxes or reduction in benefits and gives it to those involved in research and development, usually the relatively well-to-do. It is sometimes suggested that the poor would nevertheless benefit by a "trickle-down" effect; but any policy to make the rich richer at the expense of the poor can be defended in this way.

Finally, the proposed strategy has the enormous attraction that it appears to offer an easy way out of the economic problems the Canadian economy is experiencing and that are predicted for the future. There is no need for Canadians to face up to the uncomfortable necessity of spurring themselves on to improved performance, for businessmen to be more enterprising and more energetic and efficient managers, and for workers to work harder and with greater eagerness to do a good job. All that is necessary is for the government to put a little money in the right place and restrain competition from abroad, and the rest of the population to put on their white coats, and everyone will be able to stroll happily to a prosperous future!

Any proposal that a strategy of targeting winning industries should be adopted in Canada should therefore be approached with caution. Much more study needs to be carried out before it is accepted as the right one. It should be clearly understood that the onus to demonstrate that the strategy is the best one for Canada lies with its proponents. It is not for them merely to assert without adequate proof that it is so and demand it be followed, unless its opponents can prove the contrary.

If the general principle can be established with an acceptable level of probability, the selection of the Canadian industries to be targets still remains. When determining whether a particular industry promises to be a winner, the aid of scientists and engineers must first be sought to satisfy oneself that the technical problems of producing the product can be overcome, and the risks of the enterprise assessed. Difficult as this may be, it is easy compared with the next stage of determining if the proposed product can be sold competitively. This stage is in two parts. First, estimates must be made of future demand for products of this type at home and abroad. Demand projections are always open to huge error (even mammoth corporations with enormous resources at their command and operating in a relatively simple market and a well-established product sometimes make great blunders–as when Ford misread the market for its Edsel). But the particular problem in the present context is that most developed countries are forcing the growth of much the same industries as are advocated for Canada, and all are basing their plans on supplying export markets. Even in Japan, with a population more than four times that of Canada, it is realized that the home market cannot justify the maintenance of some of the modern "glamour" industries. If all these efforts bear fruit, there could well be a world glut of "high tech" products.

The second stage is to assess the likely cost of producing the proposed product in Canada. This is the part usually glossed over by proponents of the strategy of targeting winning industries; yet this is quite crucial. One must consider if the resources, skills and experience Canada possesses can be harnessed to produce products to satisfy the expected demand at a cost that ensures a viable industry, making allowance for any public costs and benefits that do not affect the firm. A promise that an industry will achieve viability some time in the future is not enough; there should be prospects that the industry will be sufficiently profitable in the future to repay with interest the public money invested in it during the development phase. (Again, the fall-back of "but it will create jobs" should be rejected for the reasons discussed above.) Risk must also feature in the calculation; a higher rate of return should be expected from a high-risk enterprise as compensation for the risk.

**Other Strategies**

Possible industrial strategies for Canada, which are alternatives to one of targeting winning industries, are so numerous that it would be impossible to deal with them adequately here. Brief mention of some of the more obvious ones must suffice.

Since all previous discussion has been concerned with manufacturing industry, the desirability of governments basing their strategy on agriculture, fishing, forest industries, mining or service industries, will not be considered. It is, however, appropriate to observe that there is no a priori reason to assume that manufacturing has a unique virtue. Proponents of the thesis that manufacturing industry holds out opportunities to speed the economic advancement of Canada which are superior to those offered by other sectors of the economy should be ready to prove it.

The question to be addressed is, assuming that the objective of governments is to increase to the maximum the real incomes of Canadians as a whole, and that manufacturing is the best "engine of growth," what strategies might be considered as options to that of targeting winning industries?

The first is to avoid considering the matter within the concept of industries (micro-electronics, biotechnology, telecommunications and the like) but to concentrate instead on industrial firms, whatever industry they belong to. The strategy then becomes one of "targeting winning firms." In the end, governments have to deal with individual firms, not with industries, and seeking out appropriate firms to target directly without a preliminary exercise at the industry level has one great advantage (other than the obvious one of saving a lot of time). It is that one would not thereby miss a lot of winning firms hidden in losing industries. As previously observed, the formal techniques used in the countries surveyed may well reject as many winning firms in losing industries as there are winning firms in the winning industries. Targeting winning industries is of use only if it narrows the search for winning firms, but there is no reason to believe that it does that.

In targeting winning firms, consideration would have to be given by government to the future markets for the products firms are producing, or propose to produce. But other considerations of great

importance include the track record of the firm and its executives; indeed if they have a good track record of anticipating the needs of the market-place, it might well be presumptuous to second guess them. The general competence of the management of the company, its labour relations history, its ability to control costs and to be innovative in respect of new methods, and its credit standing are all matters relevant to judging its prospects. If all these factors appear to be favourable, then it may be designated a winner, whichever industry it belongs to.

Another favourable approach is again obscured by the terminology in general use. "High technology" is a term that is sometimes applied to firms which produce robots, telephone switching equipment and the like (the meaning upon which the preceding discussion was based, since this appears to be the usual one implicitly adopted) and sometimes to firms which use "high technology" to produce what may well be an old product (as would be the case if a fish packer adopted computer-controlled equipment for filleting fish). An industrial strategy that concentrates on encouraging traditional industries to adopt the latest and most efficient methods, based upon the most modern equipment, wherever it is made (studies have suggested that the real problem in Canadian industry has been the slowness of firms to adopt "high technology" methods[3]), might, if successful, turn losers into winners (firms, that is, not industries). The low productivity of Canadian industry, so deplored in publications of the Science Council of Canada, would thereby be improved, and the special advantages Canada has had in its traditional industries may continue to be explored. Such a strategy might well also have the spin-off of expanding the market for Canadian firms making "high tech" products.

One aspect of this matter calls for some further comment. The instinct of the French government and the Bureau for Business and Economic Development (BBED) is to concentrate efforts on large firms (the "core" firms, in Science Council terminology) in the belief that where they lead the lesser fry would follow. Such a belief should not be taken as self-evident. The German government's experience has led it to precisely the opposite conclusion. It discovered from experience in the 1970s that large firms were more hidebound and less responsive and innovative than were smaller firms.

The next type of strategy which ought be considered is that which seeks to improve Canada's resources, its workers, managers and entrepreneurs in particular, and utilize them more effectively. Labour training might be stepped up to produce more skilled workers, particularly in those industries that need skills in the operation and maintenance of modern computer-controlled machinery, and other skills not previously called for. The willingness of entrepreneurs to take risks, instead of being content to carry on making the same old products by the same old ways and selling them by the same techniques in the same markets, might also be stimulated. And the very large resources of universities, highly trained in the sciences, engineering, management subjects, economics and other disciplines, could be used with advantage. Universities and business tend to live in different solitudes, not through any strong reluctance to help each other, but mainly because of the lack of a mechanism to bring them together.

The means by which these strategies may be carried out in Canada call for no special comment. Throughout the world the standard approaches are to offer money in the form of grants, loans and guarantees or to provide a more lucrative and secure position through government purchasing or subsidization of sales to private customers. It should be noted, however, that governments need a variety of incentives, since some are relevant to some firms but not to others. For instance, tax incentives are attractive only to firms that make profits, capital grants and loans are of importance mainly to highly automated firms, loan guarantees are mainly of interest to small firms with low credit rating, and so on.

Another possible approach would be to increase the amount of knowledge at the disposal of Canadian firms. The amount of available information relevant to the decisions a firm must take is vast. Even large firms staffed by specialists in the various disciplines cannot hope to know it all; small firms are obliged to operate in an atmosphere of ignorance about production techniques, market opportunities and management techniques (no small firm these days can possibly know the range and capabilities of management information systems equipment, for instance). This ignorance increases the risks of firms and discourages them from being as enterprising as they normally might.

Governments often have economies of scale available to them and therefore have the advantage of being able to increase the flow of information at lower cost than firms would have to incur if they each tried to secure their own data.

It should surprise no one that all these strategies are well understood already and have been included in previous programs at federal or provincial levels or both. The public services in Canada are staffed by intelligent and imaginative people and it would be surprising if after a quarter century of searching for solutions they had not thought up almost everything there was. Perhaps the key to success lies less in the programs themselves than in their method of delivery. The number of programs relevant to a manufacturing firm available from federal and provincial governments in Canada is bewildering and there is some evidence that few businesses know more than a small fraction of the incentives available to them. (This situation is not unique to Canada; a study carried out in Scotland a short while ago found a similar state of affairs.) And small businessmen are often intimidated by the bureaucracy and lack the experience necessary to plug into the various programs. It is true that modest attempts have been made to publicize programs and to set up one-stop shopping that provides one initial point of contact for all government programs. But government departments still tend to draw up the programs, make a few announcements, and then sit back and wait for clients. In Canada, there is not the close relationship between public servants and businessmen that exists in France, or the willingness of Japanese businessmen to comply with the wishes of government. These circumstances make program delivery more difficult, but greater efforts might be devoted to improving the situation.

Finally, one basic point needs to be made. No industrial strategy for Canada is likely to succeed unless attitudes are right. Development calls for initiative on the part of the entrepreneurs of Canada's industrial system; they must be prepared to take risks rather than just trying to hold on to what they already have and relying on governments to protect them from misfortune. There must be enterprise on the part of managers who must be continually seeking for improved methods, rather than being content to do things the same way as they have been

done before. There must be an eagerness on the part of workers to do the best job they can, rather than concentrating simply upon maximum income with greatest security. And governments and their public servants must strive to create the environment in which business may flourish, rather than creating unnecessary obstacles that distract managers from the tasks upon which they should be concentrating.

**Notes**

1. See A.E. Safarian, The Performance of Foreign-Owned Firms in Canada (Montreal: Private Planning Association, Canadian-American Committee, 1969).

2. See, for instance, the statement by Donald Johnston, Minister of Economic Development as reported in the Globe and Mail (4 May 1983), p. 1.

3. See, for instance, G.C. Hufbauer, Synthetic Materials and the Theory of International Trade (Cambridge: Harvard University Press, 1966); D.J. Daly and S. Globerman, Tariff and Science Policies: Applications of a Model of Nationalism (Toronto: University of Toronto Press for Ontario Economic Council, 1976).

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